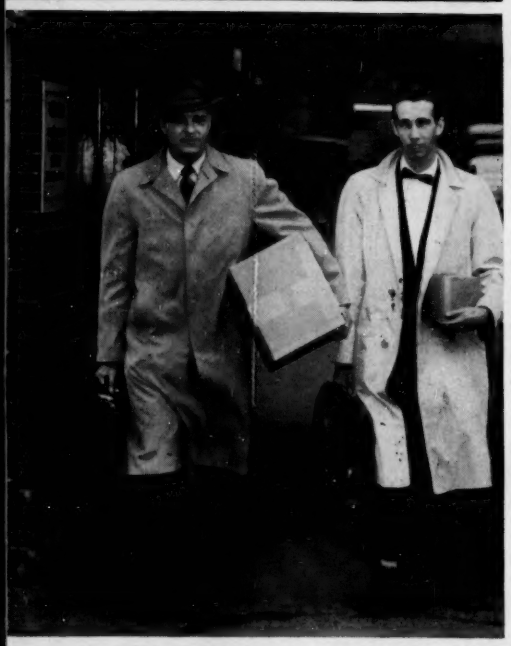
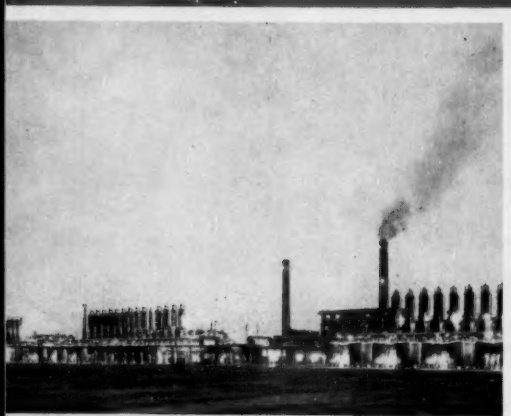


Chemical Week

June 9, 1956

Price 35 cents



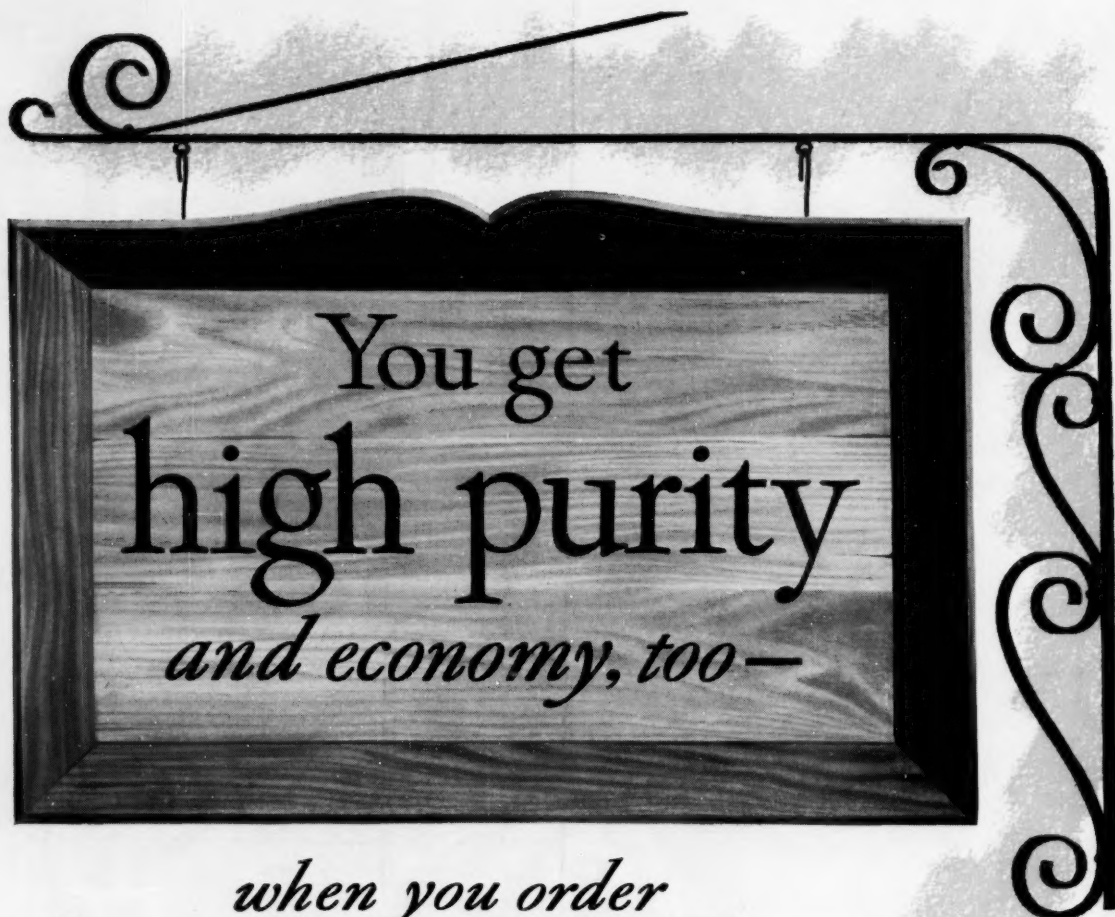
► U.S. butadiene plant though Carbide bid most, Publicker and Justice Dept. fight the sale . p. 18

... but even if they kill this deal, government will still try to sell its chemical plants . p. 27

P&G and Lever lock horns in first big ad battle for heavy-duty liquid detergent market . . p. 46

Can slug-at-a-time column lick the problems of commercial-scale continuous ion exchange? . . . p. 74

► From customer panels, Corning's product engineers get quick assays of new product potential . . p. 96



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solvents from Shell Chemical

When you make Shell Chemical your headquarters for solvents, you can be sure that the products you receive will meet or exceed the highest purity standards set by industry.

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Mesityl Oxide
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Methyl Isobutyl Ketone
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Ethyl Alcohol
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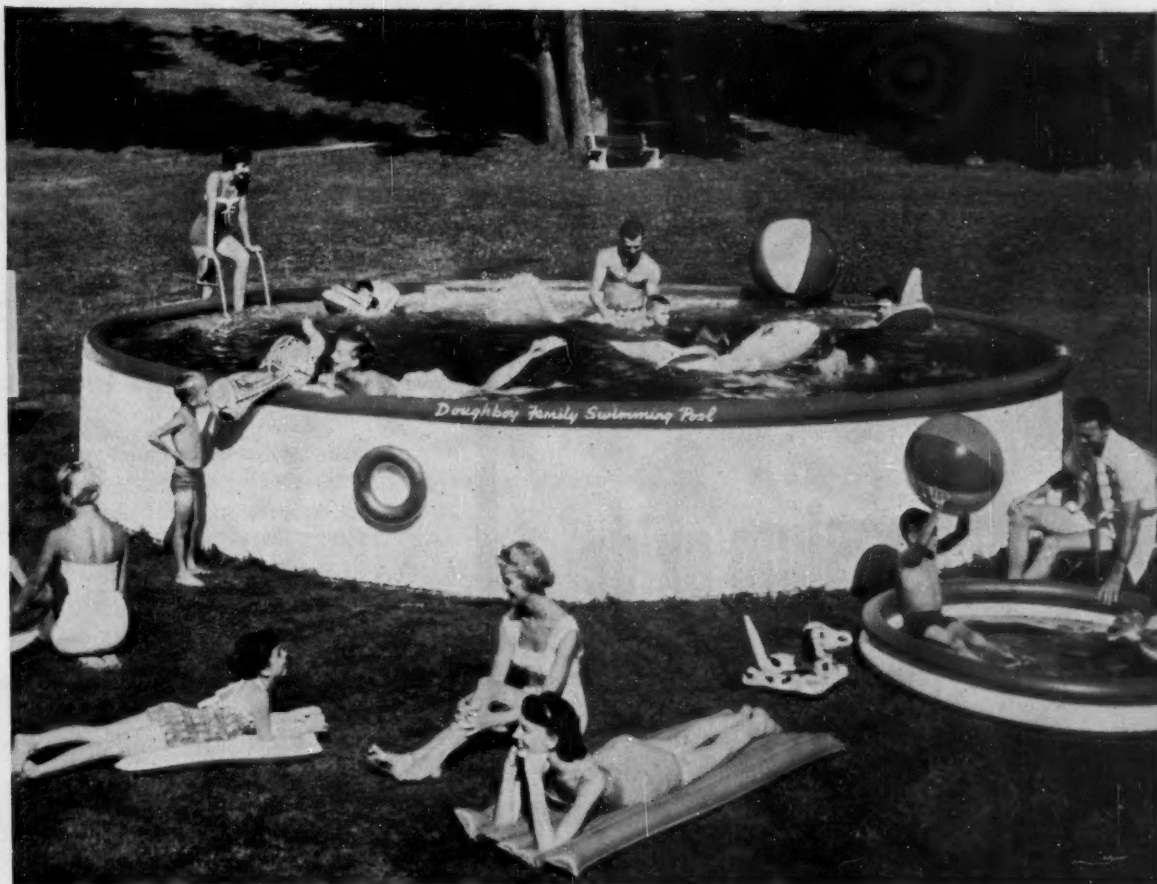


Photo courtesy Doughboy Industries, Inc., New Richmond, Wisconsin

The secret of staying in the "swim"



Inflatable pools have become big business, both in size and quantity. Where once only toddlers could enjoy them, now, through improved design and materials, whole families can take a cooling plunge—and many do!

One of the materials now used in these big, low-cost pools is PLIOVIC. PLIOVIC is the name for a series of easy-processing, high-quality vinyl resins, each designed to do a specific job. For instance, one type of PLIOVIC is ideally suited to calendering the heavy-gauge sheeting for the walls and rims of pools, while another can be used to advantage in dispersions for protecting the fabric bottoms and steel wire wall supports. Both achieve the essential physical properties with a minimum of processing and cost problems.

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Chemical Week

TOP OF THE WEEK

June 9, 1956

The Supreme Court refuses to hear Schering's patent plea, but the company will keep searching for new ways to save its patentsp. 17

Should U.S. firms finance Canada's chemical expansion? Here's what the Canadians thinkp. 20

In mental drugs, look for the federal government to take a more active part in evaluationp. 111

What's ahead for pesticides? Latest USDA rundown points to one definite conclusion: for the 1955-56 crop year there'll be enough for all ag needsp. 129

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21 TVA can now build its own power plants; here's how this will affect chemical firms

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Skids may be greased for faster government exit from chemical business

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129 MARKETS

132 Rutile for titanium: from Australia's beaches to U.S. consumers via a new \$1.5-million venture



... C-R CHILL-VECTOR UNITS

Chemical and food processors are discovering that during the summer it is possible to use excess winter steam capacity for extremely economical water chilling, using a Croll - Reynolds steam-jet CHILL-VECTOR system.

And CHILL-VECTOR systems are economical the year 'round . . . no moving parts (except for a water circulating pump) . . . no lubrication . . . and extremely low maintenance cost. Low pressure or waste steam can often be used reducing operating expenses considerably.

Let a Croll - Reynolds Engineer show you the many other advantages of these efficient CHILL-VECTOR units. Write, wire or phone . . .



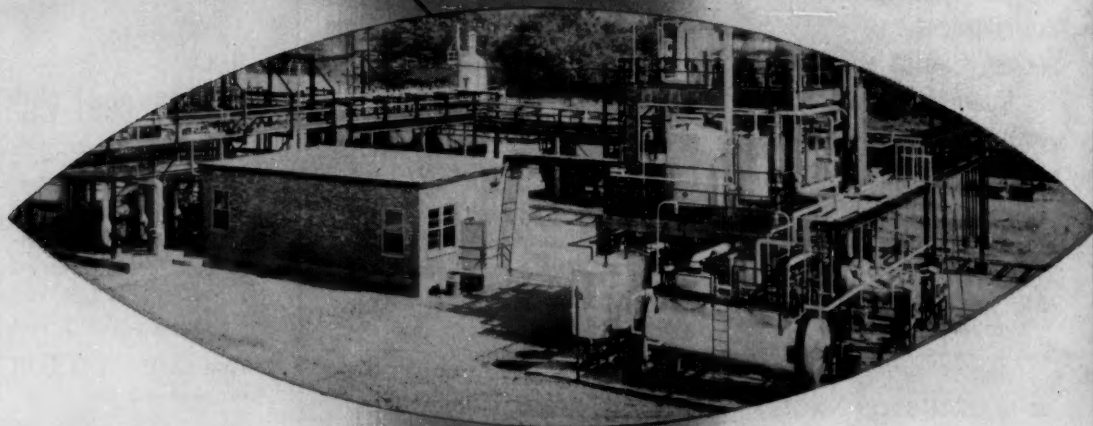
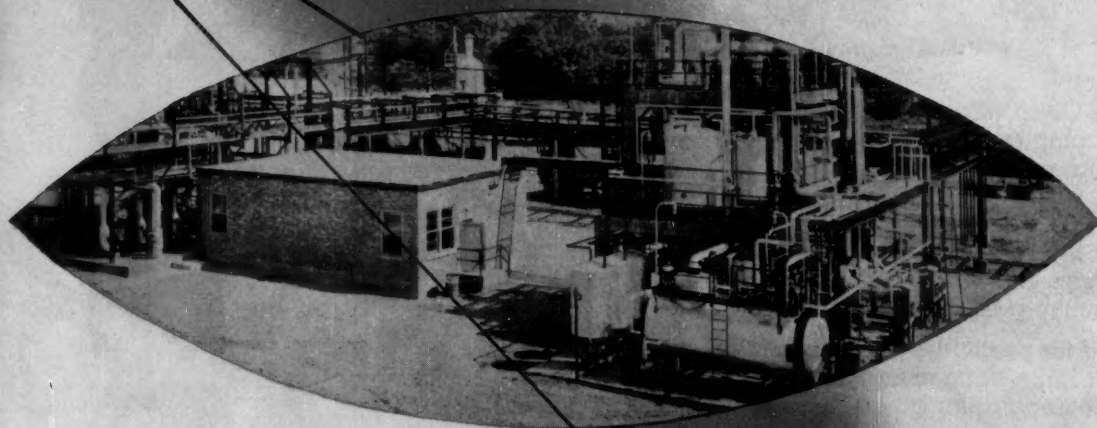
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Here's a **DEEPWATER PORT**
Worth Investigating...

LUDINGTON, MICHIGAN

Ludington is one of several fine Great Lakes ports in Outstate Michigan.*

It's a Great Lakes port and a seaport too, since the Great Lakes-St. Lawrence waterway gives access to the ocean.

Excellent industrial sites are available on Ludington's sheltered harbor, Pere Marquette Lake, which is connected with Lake Michigan by a ship channel two-thirds of a mile long.

Ludington is a city of 10,000 people, with several times that number within easy driving distance. It is served by the Chesapeake & Ohio Railroad. Year-around railroad car and automobile ferries operate between Ludington and Wisconsin ports. Five motor freight lines provide trucking service to Midwest market centers.

Beneath Ludington lies a portion of Outstate Michigan's huge salt deposit. Industrial chemicals are produced here, along with electric fuel pumps, game boards, furniture, castings, construction equipment, stampings and watch cases.

A special advantage: Ludington is in Outstate Michigan's great vacation land. What better place for an industry or branch plant than a good port city in a region where people really enjoy living?

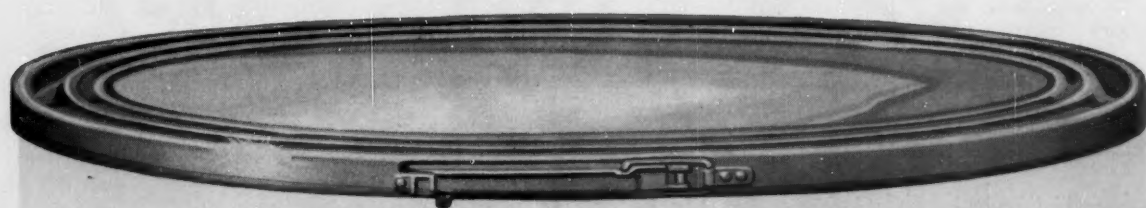
** Others are Bay City, Saginaw and Cheboygan on Lake Huron or connecting waters, and Muskegon, Manistee, Frankfort, Traverse City, East Jordan and Boyne City on the Lake Michigan side.*

For further information contact our Industrial Development Department.

CONSUMERS POWER COMPANY

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Outstate Michigan People



The Best Dressed Products "Wear" Rheem Fibre Drums



A customer looks first at your package, and then at your product. And, as you well know, his mind is often made up before the second look. That's why *choice of containers is so important*—why Rheem Fibre Drums may make just the good first impression your product needs and rates.

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First High Pressure Acetylene Chemicals Plant In U.S. Now In Operation

**Plant Built By Lummus For
General Aniline & Film
Corporation At Calvert
City, Kentucky Has Been
Operating Smoothly
Since Startup**

Early in 1956 the first full scale commercial installation in this country for the production of acetylene chemicals by high pressure techniques was placed in operation at Calvert City, Kentucky. It was engineered and constructed by The Lummus Company based on General Aniline & Film Corporation's design. GAF is the pioneer of high pressure acetylene technology in this country.

The chemicals presently manufactured include propargyl alcohol, butynediol, 1,4-butanediol, butyrolactone, pyrrolidone, vinylpyrrolidone, polyvinylpyrrolidone (PVP).

As a result of extensive research, pilot plant production and market development by GAF, these products already have wide acceptance industrially for use in cosmetics, pharmaceuticals, detergents, plastics and plasticizers, fibers, textile auxiliaries, solvents, corrosion inhibitors and germicides. With full scale commercial production now under way, industry will be able to obtain these materials at new low prices and in multi-million pound quantities.

The engineering and construction of this new and unusual proc-

essing plant required the closest cooperation between GAF and Lummus personnel at all levels, and it proceeded smoothly through a successful startup.

This project is one more indication of the ability of The Lummus Company to handle challenging installations for the chemical process industries. Look to Lummus when you have a unique engineering and construction problem.

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Hague, Bombay. **Sales Offices:**
Chicago, Caracas. **Heat Exchanger
Plant:** Honesdale, Pennsylvania.
Fabricated Piping Plant: East
Chicago, Indiana.



Business

Newsletter

June 9, 1956

CHEMICAL WEEK

Senate probers plan an investigation of the Mexican hormone business, centering their attack on the alleged cartel activities of Syntex, S.A. (*CW Business Newsletter*, May 12).

The investigators, working for a Senate Judiciary Subcommittee, will outline in public hearings the unsuccessful efforts by U.S. companies to get in on the production of cortisone intermediates from the Mexican barbasco root. Insiders term the inquiry a "hot" one.

Stauffer Chemical has purchased 50% of the outstanding common stock of San Francisco Chemical from British-owned Mountain Copper Co. Stauffer already owns claims that are operated by San Francisco Chemical in southwestern Wyoming, and has been one of the firm's major customers.

Meanwhile, a phosphate expansion is in the works. Potash Co. of America will soon decide whether to build a triple superphosphate plant, or an elemental phosphorus furnace, or both, near Paris, Idaho. The company would use open-pit-mined rock, is now experimentally mining on 1,000 acres.

And bids will be called for next month on a \$5-million elemental phosphorus furnace and rock beneficiation plant that Central Farmers Fertilizer (Chicago) will build near Georgetown, Idaho.

Also highlighting the week's expansion—Texas Petrochemical operations.

Warren Petroleum (a Gulf Oil subsidiary) will definitely build a multi-million-dollar petrochemical unit on a 300-acre tract adjoining the now abuilding plant of Texas Butadiene & Chemical Corp., near Houston. Warren, however, won't start construction this year.

And Texas Gas Corp., which has substantial gas reserves in the Gulf area, is looking into the feasibility of recovering petrochemical raw materials from its reserves. The company, which now recovers ethane and butane, is interested in developing other feed stocks for petrochemical producers.

Petrochemicals are booming in Britain. Monsanto's British subsidiary has been offered a plant site adjacent to the Esso Petroleum refinery at Fawley on which to build a new plant to use refinery by-products. The first operations "will add substantially" to Monsanto's production of plastic raw materials in Great Britain.

Dow Chemical has picked up the option on the 1,700-acre site two miles north of Plaquemine, La., which it wanted for expansion (*CW*, March 3, p. 14).

Business Newsletter

(Continued)

Meanwhile, it has finalized plans for a new administrative center in Midland. While it is planning immediate construction of three buildings, the 80-acre area has room for at least six more.

The management fight at Virginia-Carolina Chemical is getting down to proxies. Countering the plan of the insurgent group to solicit an unofficial "letter of intent" from stockholders that six of the group be immediately elected to the V-C board (*CW Business Newsletter*, June 2), management has scheduled for July 18 a special meeting of stockholders at which, reports President Joseph Howell, they "will be given the opportunity to remove and replace any directors whose presence on the board they feel is not in the best interest of the company."

Too, the board has changed the company bylaws—which provided that a vote of a majority of total shares of stock was necessary to remove a director from office. Removal can now be effected by the same vote as an election to the board, a simple majority of stock present at a meeting.

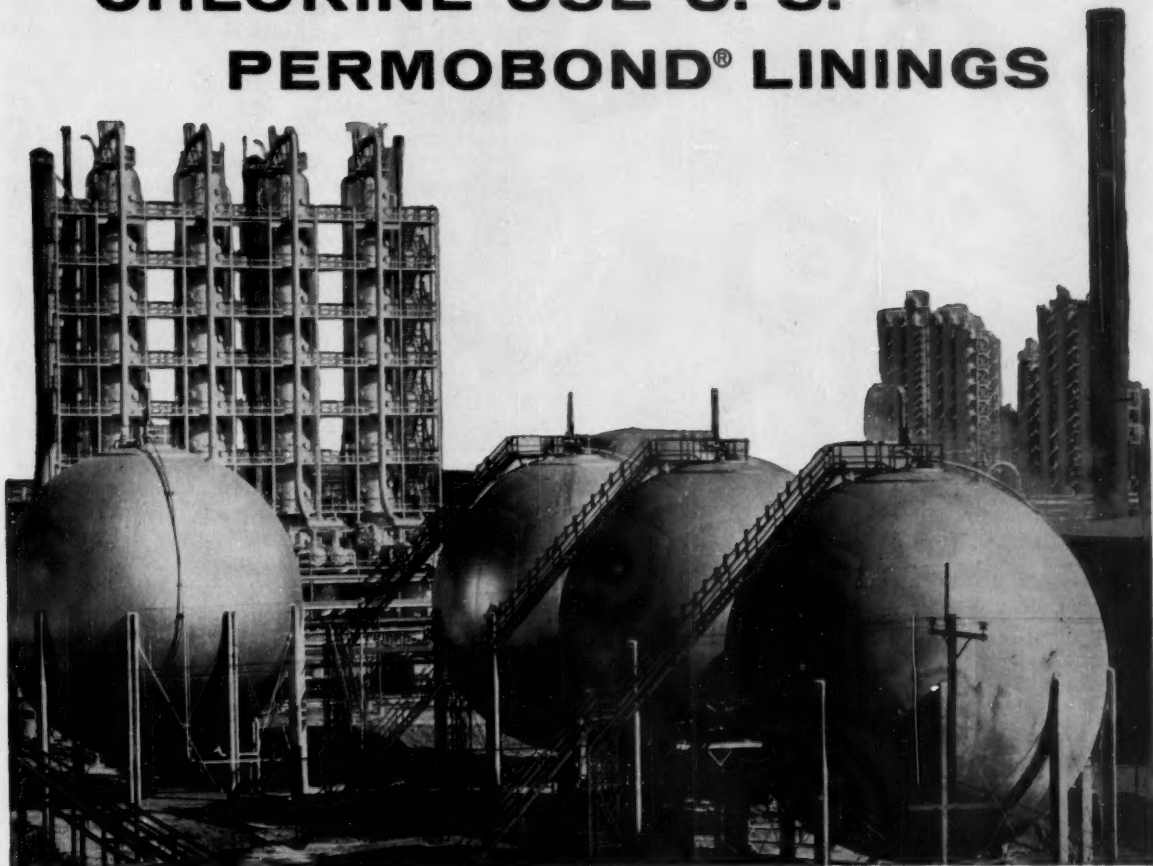
Income from the proposed sulfur extraction tax increase in Louisiana (*CW Business Newsletter*, April 19) would go to help pay increased salaries to school teachers. That's the politically attractive tactic adopted by Louisiana's Gov. Earl K. Long in attempting to get the tax upped from \$1.03 to \$3/long ton.

But opposition is mobilizing: the New Orleans Board of Trade has protested on grounds that the availability of sulfur has attracted sulfur-consuming industries to the state. Too, it points out that the proposed tax "is so drastic that it would put the Louisiana sulfur industry at a severe competitive disadvantage with producers of sulfur out of the state." And Freeport Sulphur's E. D. Wingfield points out that the proposed tax would be twice that charged in Texas—where one mine alone produces more sulfur than all of Louisiana's mines.

But there's a positive note from Louisiana, too: the legislature is considering an amendment to the state constitution that would aid development of the Baton Rouge port. If the proposal passes, the city's port commission could borrow up to \$50 million for capital improvements. Now it's limited to having \$15 million outstanding at any one time.

Cost of South Charleston's sewer bonds will be \$80,000 less because Carbide and Carbon Chemicals will build and operate—at cost—a new sewage treatment plant there (*CW*, March 31, p. 25). This participation by the company resulted in the \$2-million bond issue being sold last week at 96% of par—rather than at 92% as in the original bid.

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Since Chlorine is produced under highly corrosive conditions and because United States Rubber Company's specially compounded Permobond #5471 proves superior for lining the amalgam type cells plus the piping and process tanks, then *you can be sure* that U. S. Permobond is the right lining for *all* chemical processes using this highly corrosive basic chemical.

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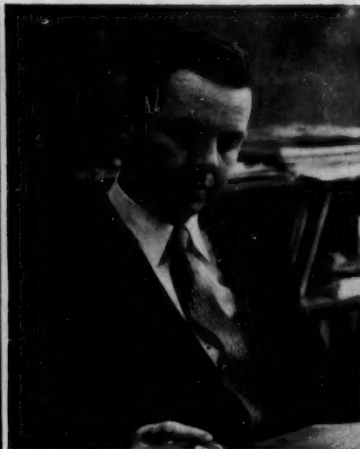
FROM EVERY STANDPOINT, PERMOBOND #5471 IS THE SUPERIOR LINING.



Mechanical Goods Division

United States Rubber

OPINION



COAUTHORS: Richard F. Messing (left); Richard L. Bolin (right).

'Exceedingly Good'

DEAR MR. JOHNSON: Your discussion of business planning (*CW Report*, May 19) . . . is an exceedingly good treatment of a very complicated and very basic subject—and you managed to compress the essentials into a small compass and to present very complicated things in exceedingly clear form.

PETER F. DRUCKER
Montclair, N.J.

Reader Drucker's compliments should be directed less to us than to Authors Bolin and Messing, whose photographs, incidentally, were transposed in the report (p. 70). Just to set the story straight, here they are (above)—properly identified.—Ed.

Anybody's Guess

TO THE EDITOR: Your reporting of the new light-stability formulation for vinyl developed by Monsanto (*CW*, May 26, p. 71; June 2, p. 39) may have given your readers an inflated impression of (1) the probable impact of this development on the vinyl market and (2) the paternity credits due our limelight-stable Joe Darby.

Although one can envision a considerable market expansion for vinyl having three times its former outdoor durability, there is no factual basis for projecting a tripling of the market for outdoor vinyl as a result of this development. Its probable market impact is anybody's guess.

Darby also stresses that all com-

ponents of the new stabilization system are commercially available stabilizers. Darby's contribution is their unique combination—and the obsoleting of what used to be adequate accelerated test methods for vinyl light stability. It took 13 months of such continuous testing to break down Darby's stabilized vinyl samples.

GEORGE K. JOHNSON
Public Relations
Monsanto Chemical Co.
St. Louis, Mo.

Sees No Novelty

DEAR MR. JOHNSON: Prudently CHEMICAL WEEK (April 7) starts with "If" in news describing a textile fungicide, viz., the results of the Drs. Bottoms and Abrams who "Teamed Against Fungus." Doubtless, this "If" is going to assert itself when the team wakes up to the stark realization that anionic, water-solubilized, odorless, concentrated fungicides, not affecting hand, color, dyes, dyeing or washing, have been in use for over four years. . . .

This writer manufactures one Cop-R-Ate, trademarked, concentrated, anionic, water-solubilized copper 8-quinolinolate for textile impregnation, others for use in the paper, paint and agricultural fields. Arbitrarily, millions of pounds of organic fibers have been processed with these materials. They have been subjected to prolonged soil burial leaching tests (in several instances extended to 5 weeks and

longer), and further screened by federal agencies for body toxicity and the like. . . .

The new approach of Bottoms-Abrams refers to a cellular radical coupling the copper. The fungitoxicity of cellular materials, resins and the like has been widely explored by Drs. Ralph Siu, Ashcroft and Cook.

. . . It is hoped that further information will be published by Bottoms-Abrams, clarifying the priority and novelty of their findings. . . .

H. L. VON GOEHDE
Boston, Mass.

Complications in Portland

DEAR MR. SCHULZ: In connection with the special article on tax rates on chemical plants (*May 12*), I have the following information to submit for your consideration.

The millage tax rates shown for Portland are correct, but the table you show for a theoretical assessment of a hypothetical chemical plant is inaccurate for Portland. I realize that Jim Ferguson did his best to straighten out what is a very complex matter, but due to a local situation where the county assessor, the county board of equalization, and the state tax commission are involved in a controversy over assessment procedures, it was quite hard to come up with the right answer.

I believe what you were trying to find is the actual assessment of a chemical plant in various locations. Eliminating all the technical distinction between "market value," "true cash value" and the "normal conditions factor," which appear in our law, manufacturing plants in Portland are now assessed somewhere between 33% and 40% of their "market" value. This same percentage

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
H. C. E. Johnson, Chemical Week,
330 W. 42nd St., New York 36,
N.Y.

from seed sticker to shampoo . . .

DOW



ALL THESE PRODUCTS ARE MADE BETTER WITH METHOCEL

DOW METHYLCELLULOSE
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There seems to be no limit to the number of applications for Methocel® (Dow methylcellulose). Its use is ever increasing, and for good reason.

Being a synthetic, the quality of this water-soluble gum never varies. And nine viscosity types and three grades offer a selection greater than any other gum—natural or

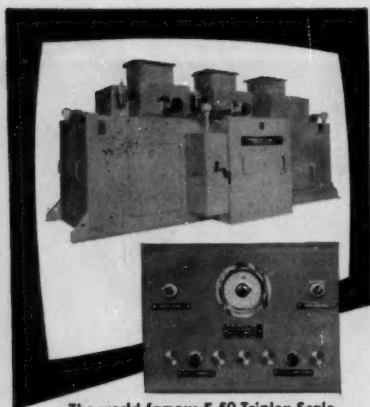
synthetic. This broad range simplifies development and control work; has established Methocel as a dependable suspending agent, thickener and film former . . . as well as a dispersing agent, binder and emulsion stabilizer.

The fact that Methocel is an important ingredient in the manufacture of hundreds of products—from seed sticker, paint, paper and pharmaceuticals to shampoo—indicates its versatility and suggests that "Methocel may improve your product and bring economies!"

Today, write for a sample and indicate the proposed area of use so that we may send the ideal viscosity. THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. ME 811A.

you can depend on **DOW CHEMICALS**

DOW



The world-famous E-50 Triplex Scale, just one of several multi-unit Richardson installations available — coupled with a Richardson Remote Stop Counter Panel — gives you low-cost automatic proportioning.

MINIMUM CAPITAL INVESTMENT FOR

Automatic Proportioning

The simplest, most dependable, accurate and inexpensive system you can own!

Do you think in terms of an astronomical investment when you think of an automated proportioning system? It ain't — as the song goes — necessarily so!

A simplified RICHARDSON system in many cases can do the job of a much more expensive and complex fully-automated system. It's made up of Richardson Scale batch weighing units (one for each ingredient) — interlocked for simultaneous delivery — plus a Richardson Remote Stop Counter Panel. Because of its speed, it gives virtually continuous-stream delivery — with the kind of accuracy you can get only from a batch weighing scale!

If cutting costs and upping production on a minimum investment sounds interesting to you, write (at no obligation) for full information about a Richardson System to fit the special and exact needs of your plant. ☎ 3077

Do it today!

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

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Detroit • Houston • Memphis • Minneapolis • New
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Nottingham, England

OPINION

applied—according to my knowledge—in 1945.

"Market value" is not the same as "market price," and is a standard term used by appraisers that very nearly approaches reproduction costs less depreciation.

I realize this whole matter is somewhat complicated, but the assessment rates shown for Portland are much higher than is actually the case, so I know you would want to make some correction on this point in your magazine.

CHESTER K. STERRETT
Manager, Industries Dept.
Portland Chamber of Commerce
Portland, Ore.

Truly, the matter is complicated, and more than somewhat; we sympathize with Portland taxpayers, who must be fingering their checkbooks nervously while those state and county officials wrangle over how much weight to give to "market value," "true cash value," etc. But in our relatively short news article, the main points we wanted to make were that property taxes generally are going up, and that this rise is faster in some places than in others.—Ed.

Too Long Before Seeding?

DEAR MR. JOHNSON: [Re] . . . your article "Easier than Weeding" (May 5).

I think that one of the serious drawbacks of Du Pont's new product will be the inability to reseed for anywhere from 90 to 120 days after its usage. If this period could be shortened to 1-2 months, it would have much greater potential. The emergence of crabgrass where early elimination has been practiced is greatly reduced by just Di-Met itself, but if we could recommend some additional chemical that would be even more effective on the seeds remaining in the soil, such a recommendation would be made for its use with Di-Met on the last required application.

Du Pont has supplied us with samples of its material, and this shall be thoroughly tested. . . .

Having had considerable experience with both the mercury and potassium compounds, together with Di-Met [disodium monomethyl arsonate], if I were writing such an article I certainly would emphasize the terrific difference obtained when these three chemicals

are comparatively tested. In my opinion, there is absolutely no comparison between Di-Met and the other two compounds for selectivity, effectiveness and wide range of latitude in application, yet with satisfactory consumer results. . . .

O. E. LINCK
President
O. E. Linck Co., Inc.
Clifton, N.J.

Add a Barrier

DEAR MR. JOHNSON: Referring to the usage of Fischer-Tropsch mineral waxes in conjunction with polyethylene to increase its rigidity . . . your Technology Newsletter . . . (May 26) contained a serious omission. The facts as sent to you in our original release referring to the article published in *Kunststoffe* indicated that there was a marked improvement not only in rigidity but also in transmission barriers for gases and vapors. You will note that your newsletter would tend to give exactly the opposite impression since the term "barrier" had been omitted. . . .

K. J. WASSERMAN
Vice-President
Technical Sales & Service
Dura Commodities Corp.
New York

Reader Wasserman is indeed right. Gas and vapor transmission is reduced by the treatment.—Ed.

SEE YOU THERE

Society of the Plastics Industry, Inc., 7th national plastics exposition, new Coliseum; conference and meeting, Commodore Hotel, New York, June 11-15.

Armed Forces Chemical Assn., annual meeting, Hotel Somerset, Boston, June 14-15.

American Rocket Society—American Society of Mechanical Engineers, semi-annual meeting, sessions on liquid rockets, solid rockets, ramjets, Hotel Statler, Cleveland, June 17-21.

Second International Conference on Plant Protection, Fernhurst, Sussex, England, June 18-21.

Society of the Chemical Industry, 75th annual meeting, London, July 9-14.

American Institute of Chemical Engineers, meeting, William Penn Hotel, Pittsburgh, Sept. 9-12.

International Congress on Catalysis, meeting, Bellevue-Stratford Hotel, Philadelphia, Sept. 10-14.



ATLAS

chem-memos

CHEMICALS DIVISION

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Atlas Powder Company, Canada, Ltd., Brantford, Ontario, Canada

Tween 80 makes dozens of o/w emulsions

When it comes to making oil disperse in water, TWEEN 80 is about as close to a jack-of-all-trades as you can find. Its chemical name is polyoxyethylene sorbitan mono-oleate. On the Atlas HLB scale, it has a value of 15 . . . which means that it has a high oil "solubilizing" power. This quality makes it applicable to dozens of different products in which oil and water must be mixed.

Many water-insoluble oils, such as flavor, vitamin, perfume and other volatile oils, can be made into clear "solutions"—actually transparent

water dispersions—by using TWEEN 80 as a solubilizer.

Its oil-in-water emulsifying action gives TWEEN 80 considerable ability as a detergent ingredient in shampoos, waterless hand cleaners and similar products. A sizeable amount of TWEEN 80 goes into cutting oils and self-polishing floor waxes, too.

In ointments, creams and lotions, TWEEN 80 does double duty. It is used in oil-in-water products . . . and it also lends a hand in water-in-oil emulsions as an assistant to an oil-soluble emulsifier (such as the SPAN®



products of Atlas) to reduce the amount of milling or homogenization needed for good dispersion.

If you make emulsified products, TWEEN 80 is a valuable material to know. We'll be glad to send technical data and test samples.

How sorbitol improves cosmetic creams

Sorbitol is particularly effective as a means of stabilizing water content of cosmetic creams, especially those emulsified with soap. As a humectant, sorbitol has low equilibrium moisture content and slow rate of moisture gain or loss. These qualities retard dryness and formation of crust when the cream is left exposed to the air.

Sorbitol, however, contributes other important cosmetic effects in both W/O and O/W types of creams. It provides smoother application of the cream. By its humectant nature, it releases water more gradually from the cream . . . lending a spreading or lubricating action that prevents "roll." It also gives a desirable smooth, dry feel when the cream is applied, in contrast to excessively hygroscopic materials that give a damp or sweaty effect. Its heavy body is advantageous in making foundation creams that afford good adhesion for powder.

Write us for technical data and sample of
SORBO® 70% sorbitol solution.

ATLOX® emulsifiers... favorite in weed-killers

From dandelion to mesquite, weeds take a beating today from the army of chemical herbicides. Atlas has a part in this—for we produce the large and versatile line of ATLOX emulsifiers used in making concentrates of 2,4-D and 2,4,5-T weed-killers, and in formulating other types of pesticides. These emulsifiers make toxicant-solvent mixtures easily dispersible in water for effective application.

The ATLOX family of emulsifiers is the leading choice of agricultural pesticide manufacturers the world over. If you're in the insecticide and herbicide business, it will pay you to get acquainted with the ATLOX line . . . and to call on us for help on your own formulating problems.



A new process using Glycerine, still in the laboratory stage, shows promise of solving a by-product recovery problem in the chemical industry.

For every ton of fiber produced by rayon manufacturers, more than a ton of sodium sulfate is produced. At the same time, rayon plants consume large amounts of caustic. In the past, chemists have tried unsuccessfully to find an *economical* way of converting sulfate into much-needed caustic.

Recent experiments have shown that significantly higher yields of caustic soda may be obtained by treating sodium sulfate with slaked

lime—in *Glycerine solution*.

The new process takes advantage of Glycerine's solvent and dispersing abilities. Continuing research with these properties of Glycerine may uncover practical by-product recovery processes of a similar nature for still other industrial chemicals. The unique balance of properties that has won such wide acceptance for Glycerine in the past continues to open new doors to chemical progress. In paints, foods, pharmaceuticals, packaging . . . for tomorrow's surge of new specialties . . . in formulations and reactions yet unknown, nothing takes the place of Glycerine.

This balanced group of properties keeps

Glycerine's usefulness growing

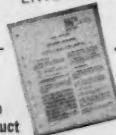
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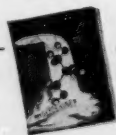
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SCHERING'S BROWN: In patent cases, wedded to a principle.

Schering's Troublous Times

1929-35 Incorporation and start-up as subsidiary of Schering, A. C.

1942 Seizure by U. S. under 1917 Trading With the Enemy Act. (German valuation: \$1,300,000.)

1952 Public sale by U. S. for \$29,131,960 — 1,760,000 shares to 15,000 shareholders.

March '55 U. S. District Court rules Schering must license pre-1952 patents as per presale agreement with U. S.

Jan. '56 Appeals Court upholds District Court judgment.

May '56 U. S. Supreme Court refuses to review Schering's appeal from judgment.



WIDE WORLD

ATTY. GENERAL BROWNELL: By inheritance, agreements are valid.

Another Obstacle on the License Course

Schering Corp.'s four-year struggle to keep a close hold on its pre-1952 antihistamine, sex hormone, sulfanamide and X-ray diagnostics patents got a thumbs-down from the U. S. Supreme Court last week.

But all indications are that the Bloomfield, N.J., company will continue to look for means of getting around a 1952 directive from the Justice Dept. telling it to grant licenses to any applicants for these patents.

Crux of the matter is Schering's protest over an agreement signed just before the U.S. offered for public sale in 1952 the entire stock of the company. Its claim: Schering management signed under duress. Sections of the agreement stipulated that Schering's German patents (received prior to the 1942 seizure of the company) would be licensed royalty-free to any applicants, and that patents received between 1942 and '52 (while the company was U.S.-held) would be licensed to any applicant on a reasonable royalty basis.

How It Began: Shortly after Scher-

ing stock was sold to the public in 1952, Hexagon Laboratories (New York), a drug manufacturer, wrote a letter to the then-U.S. Attorney General James P. McGranery, claiming it had applied to Schering for a license to manufacture Chlortrimeton antihistamine, but was refused. McGranery brought a breach-of-contract suit against Schering on the basis of the presale agreement. Schering answered it would not have signed such an agreement "if it had not been for the compulsion that prevented the exercise of the will and descretion of [the Schering] officers and directors" while the firm was operating under supervision of the Office of Alien Property.

Since that time, judges in the Federal District Court at Newark, N.J., and in the Third Circuit Court of Appeals at Philadelphia have upheld the government's position, and the Supreme Court has refused to listen to an appeal (*CW Business Newsletter*, June 2). In substance, the courts have said that the Attorney General has the right to require Schering to comply

with directives issued by his office.

Will Carry On: In spite of these setbacks, Schering management is hard at work considering its next step. In all probability, since Schering President Francis Brown has made it clear to stockholders and public that he thinks "there are fundamental moral as well as legal principles involved," the company will seek every opportunity to press its contention that the government's action is wholly unjustified. As to the Supreme Court refusal, previous denials have not always meant that the court would never reconsider an issue.

Most pharmaceutical observers believe that the opening up of Schering patents shouldn't make much difference, competitively. The company's most profitable lines—the fluorocortisone "Meti" drugs—don't come under the agreement; those lines that are affected are so firmly entrenched that new competition from other manufacturers won't mean much loss of business.

From the Justice Dept.'s standpoint

there isn't much more to do to enforce its orders. The Supreme Court's "no" this week means lower court orders go into effect. Schering and license applicants, under the agreement, must together decide what is "reasonable"; if they can't agree, they must submit to arbitration.

And unless the company can come up with a valid argument that would allow postponement, Schering could be in contempt of court if it refuses to sit down with a prospective licensee.

FDA—Hike Coming?

Cosmetic and drug manufacturers are looking to a big hike in Food & Drug Administration inspection activities in the coming fiscal year, pending Senate approval of a \$995,000 budget boost carried through the House recently. FDA, banking on the Administration-sought increase, is hoping to win back some of the ground lost as a result of budget cuts in recent years.

FDA expects that the additional money will be voted—giving the agency around \$6,779,000 to spend in the year starting July 1.

The agency will earmark about two-thirds of the additional funds for hiring more personnel. The rest will go to meet increased housekeeping expenses, travel costs, and to replace and expand the fleet of automobiles used by its far-flung field staff in making their rounds of food, drug and cosmetic plants. About \$300,000 of the increase will go to building FDA's medical program—staff, equipment, and the like.

The vigorous recruiting program already under way in the inspection field will be stepped up further in the coming year. FDA now has 258 inspectors, 31 more than it had last year. And, if its budget increase clears the Senate intact, it's planning to raise the total to 308 by June 30, 1957.

Health-Education-Welfare Secretary Marion B. Folsom says the latter increase should permit FDA to inspect 13,800 establishments in the year starting July 1, or 24% more than FDA's inspectors will have visited in the fiscal year now ending. Folsom also sees an increase from the current year's inspections of imported foods and health products—24,000 to over 29,000 next year.

Outlook—Far from Certain

When Congress three years ago passed the Rubber Disposal Act it set as its goal the sale of 28 plants—all that remained of the government's wartime venture in the synthetic rubber business. The outlook this week: far from sure.

Since 1953, 27 of the plants have been sold. And two weeks ago, the government's Rubber Disposal Commission sent Congress, for an expected routine approval, a contract of sale for the 28th and last of the rubber facilities, the 60,000-ton/year alcohol butadiene plant at Louisville, Ky.

The proposed purchaser: Union Carbide and Carbon Corp., the contract price: \$3,125,000.

Now the prospect of Congressional approval is anything but routine. The Justice Dept., basing its opinion on an obscure section of the 1953 act, refused to give its required approval to the sale. And Publicker Industries, Inc., an unsuccessful bidder for the plant, joined the attack with a claim that the commission spurned its offer to match the winning bid.

The Time, the Issues: Congress has until June 25 to exercise its power to upset the contract. It has these conflicting arguments to mull over in reaching a decision:

Sale of the Louisville plant, while authorized by special legislation passed this year; is still controlled by provisions of the 1953 act. And, Sec. 17 (4) of the 1953 law "requires that the prospective purchaser . . . actually intend to operate the facility for the purpose of manufacturing synthetic rubber or its component materials."

But the contract of sale to Carbide provides for butadiene manufacture only "when and to the extent such operation is economically feasible." Carbide frankly admits it has no plans to produce butadiene at Louisville, unless it can acquire surplus government grain for fermentation use at well below present prices. However, Carbide has agreed to keep the butadiene equipment in shape for emergency use. It would use the plant's Riverside storage for other chemicals, and perhaps by 1960, put in equipment to use a third of the plant to make acetic acid, acetic anhydride and ethyl acetate.

This Reason, Alone . . .: These plans, the Justice Dept. said, fall short of the requirements of Sec. 17 (4), and, for this reason alone, the department felt compelled to withhold its approval.

It noted that Publicker, while offering no more of a binding pledge than Carbide to use the plant for butadiene, already is "producing butadiene from alcohol at the plant under a three-year lease. Too, Publicker is "more optimistic" as to the long-range prospects of competing for markets with petroleum butadiene producers.

And the Reaction: Publicker reacted swiftly with a statement to the press challenging the commission's authority to go through with the contract in the face of an adverse report from the Attorney General. It also scored the commission for not accepting its offer to match Carbide's high bid.

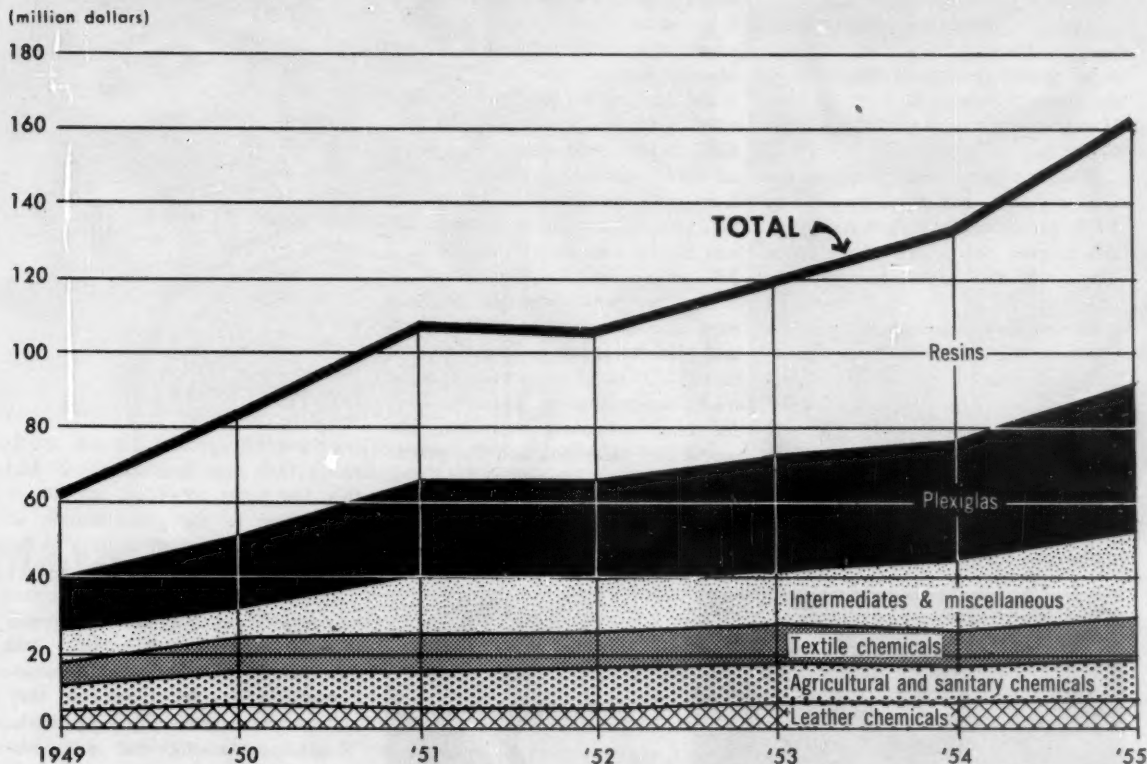
In their original bids, Carbide offered \$2 million, and Publicker only \$74,000. The commission, as the 30-day negotiating period neared an end, asked for final and binding sealed bids. It obtained advance agreement of both firms to abide by the results of this procedure—whoever bid highest would get the plant; there would be no further negotiating. In this final round, Publicker raised its offer to \$2.4 million, but was topped by Carbide's \$3,125,000 bid. The commission immediately signed with Carbide.

In Reply: The commission, for its part, sharply questioned the Justice Dept. view.

Substantial expansions of lower-cost petroleum butadiene capacity—a one-third boost is in the works—will be completed when Publicker is forced to vacate the plant at the expiration of its lease in 1958.

"It is questionable whether, by the time of termination of the Publicker lease, when the projected increases in petroleum butadiene capacity comes into existence, there will continue to be a market for alcohol butadiene sufficiently large to warrant operation of the Louisville plant. Any producer of alcohol butadiene," the commission declared, "even one such as Publicker, which is quite favorably situated with regard to its raw material, may well expect difficult sledding."

ROHM & HAAS' SALES SHIFTS



Acrylic Route to Profits

This week, chemical management has new information with which to evaluate a fast-stepping competitor, Rohm & Haas.

The information came in a prospectus filed with the Securities & Exchange Commission in connection with a forthcoming sale of some 80,000 shares of Rohm & Haas stock. The stock, a remnant of that seized by the U.S. government in 1942 under the Trading with the Enemy Act, will be sold by Attorney General Herbert Brownell. Brownell has called for bids on June 19—but he has the option of postponing the bid deadline for 20 days.

Under the law, such seized assets can be sold only if there are no court claims outstanding against such assets. This, of course, has been true of the government's Rohm & Haas assets only since March 8. On that day, the heirs of Kurt Albert, whose Resinous Products & Chemical Co. had been

merged into Rohm & Haas, agreed to accept 11% of the R&H stock in settlement of their claims. So now, the government, which sold a big block of Rohm & Haas stock in 1949, can legally sell its remaining 8% holding of the company's common and preferred.

Chemical Data: What can chemical management find of value in the data? Primarily an indication of the expansion potential of the acrylic resin and plastic field.

The figures (above) show the increasing dollar volume of R&H sales of resins and acrylic plastics—as contrasted with the older sales groupings. Resinous products, which accounted for \$70 million (43%) of the company's sales last year, represent an almost 30-fold increase from 1938's \$2.5 million. The company's plastic sales (with which it lumps sale of the by-product ammonium sulfate) totaled \$39 million in '55—well above

the peak World War II figure of \$28 million, and far above 1938's \$585,000.

The company's entry into acrylics was based on patents acquired from Rohm & Haas G.m.b.H. and licenses under I. G. Farben patents. While there had been no contractual relations between the U.S. and German firms since the start of World War II, the licensing agreements were formally abrogated only in 1948, under an antitrust consent judgment. Also involved in the judgment were former restrictive sales territory agreements between the three firms and Britain's Imperial Chemical Industries.

Rohm & Haas has also had outstanding a series of patent agreements with Du Pont, mainly royalty-free cross-licenses, entered into primarily in settlement of U.S. Patent Office interference proceedings.

The U.S. firm was established in 1909 by Otto Rohm and Otto Haas,

to exploit here Rohm's patents on an enzyme bate for leather tanning.

Though Rohm ran the German firm and Haas, the U.S. one, each held a substantial portion of the stock of the other company. In 1949, in fact, Haas still owned 40% of Rohm & Haas G.m.b.H.

Rohm, in turn, owned much of the U.S. concern, and when he died in 1939, some of his stock was held in this country for benefit of his heirs. This, plus the Albert holding, was seized in 1942.

Of the now outstanding 1 million common shares, Haas directly owns 22%; with other company officers and directors, he controls over 55% of the stock.

Always Building: In some cases where there is no worry over control of a company, stagnation may set in. But such has certainly not been true with

R&H. The company has pursued a vigorous research and expansion program. It has spent about 4% of sales on research; it is integrating its acrylic manufacture back to basic raw materials; it tries to keep its capacity well ahead of demand. Early this year, in fact, Rohm & Haas sold some methyl methacrylate to its chief acrylic competitor, Du Pont. And though Du Pont was first with its acrylic auto lacquer, R&H was not far behind (*CW*, April 28, p. 58).

The company estimates its 1956 expansion budget at about \$28 million, and plans to spend a similar amount in 1957. Most of this money is to be used in its expansion at Houston, Tex., for units producing acetylene, ammonia and methanol, and for acrylic monomers and intermediates. The units are scheduled to start coming on line in late '56 and during 1957.

less than a fourteenth. Hence, it is far more difficult north of the border, pointed out Shawinigan's Peter Blaylock (*at right, in picture*), to develop an immediately profitable project. U.S. production of polyethylene preceded Canadian production by 10 years; nylon intermediates, 15 years; ethylene glycol, 22 years; synthetic phenol, 29 years; tetraethyl lead, 33 years. "In many cases, the new Canadian plants had to be built for strategic commercial reasons before the market was really large enough to justify such a step."

As a result, estimating the payout time of a new plant is largely educated guesswork, and therefore "most conservative companies have preferred to use internally generated funds to finance their new developments." And this, the panel conceded, appears to be leading to the concentration of the Canadian chemical industry in the hands of a few large firms.

Insufficient Foresight: The reason new firms are such a risk, of course, is that so many of them fail. And they fail, said small chemical manufacturer Selwyn Irwin, because they underestimate their financial needs. "Small businesses face the same problems as big business, with a few additional ones thrown in. Learn to sell. Then obtain a working knowledge of financial accounting. After that, all you need is a good measure of luck."

A questioner from the floor "opened a can of worms," in moderator Wilfred Hall's phrase, by uttering the ugly words that had been felt but unspoken: "foreign (i.e., U.S.) domination."

The panel was agreed that, like it or not, much of the expansion money must come from U.S. firms with Canadian manufacturing subsidiaries. Having recovered research, development and plant costs in the big U.S. market, it costs them little to exploit the Canadian market by building a Canadian-size counterpart.

Then there's the problem of the Canadian investor. One panelist cited two examples of stock issues that were sold exclusively in the Canadian market. Most buyers took a small, quick profit and sold the shares to U.S. investors (over 90% of one issue ended up in U.S. hands). Why? The Canadians apparently don't have as much faith as their southerly cousins in the long-term growth potential of their own lusty young industries.



PANELISTS unhappily concede that for some years ahead . . .

Canada Needs Yankee Dollars

Continued fast growth of the Canadian chemical industry will take a lot of money, and, for many years at least, much of that money will have to come from outside Canada.

Those were the hard facts served up last week to a capacity audience at Montreal's Sheraton-Mount Royal Hotel.

In town were 1,300 registrants for the 39th annual conference of the

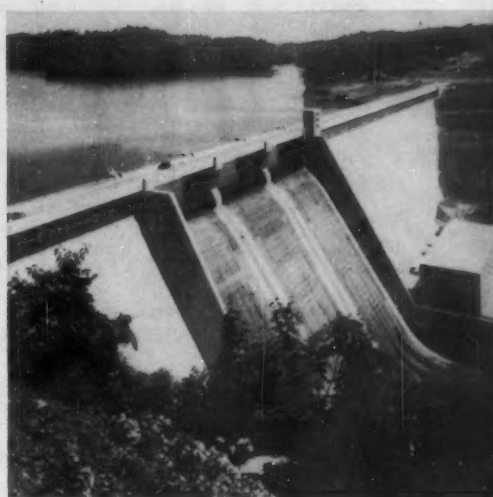
Chemical Institute of Canada, and at least a fifth of them crowded into the ornate Normandie Room to hear the "Symposium on Financing the Canadian Chemical Industry."

Sparse Markets: Canada's population is less than a tenth of that in the U.S., and its gross national product is

* Left to right, Harold B. Fewkes, Sun Life Assurance Co.; Dudley Dawson, Investment banker; Selwyn Irwin, president, McArthur Irwin, Ltd.; Wilfred N. Hall, Dominion Tar and Chemical; and Peter W. Blaylock, vice-president, Shawinigan Chemicals, Ltd.



STEAM AT JOHNSONVILLE: TVA will expand this and other plants with money from its own pocket. But new plants and a freer rein mean . . .



More Power for TVA

Congress has piloted the Tennessee Valley Authority further into the realm of privately controlled industry. A bill has finally been passed and signed to let TVA use its own revenues for building new generating equipment.

It was a victory for TVA partisans that may have far-reaching effects on many of the major chemical producers now operating electrochemical plants in that area.

In passing the bill, Congress rejected an Administration request for an appropriation for a new generating unit at the existing John Sevier steam plant. Reasoning: the appropriation isn't needed because TVA should use its own funds for the job. Taking advantage of this reasoning, TVA will also use its own funds to finance two additional units at the Johnsonville plant (above).

It's not the amount of the appropriation—\$3.5 million—that's important; it's the principle. The Congressional action may set a powerful precedent for future hassling over TVA expansion.

Chemical Importance: What will this mean to chemical companies' future planning?

First, there's a possibility that power rates may be nudged upward. With TVA using its own funds, some of the expense will probably have to be shared by the consuming companies.

However, most are confident their plants have good potentials for profit, and they are not going to let higher power rates spike any plans they may have in the area. Such relatively large companies as Diamond Alkali, Monsanto, General Aniline, Air Reduction, to note only a few, feel that they are big enough to absorb most hikes without undue effect on corporate profits. But, of course, they're far from enthusiastic about the possibility of paying more for power.

One official of Diamond Alkali points out that he's not convinced that power prices will be upped at all. Diamond's rates were reduced from what the Army Chemical Corps paid when it operated Diamond's present Muscle Shoals chlorine and caustic plant.

New Companies: Perhaps more significant, there's a good possibility that the move will actually encourage other companies to locate in the area.

Many companies would like to make inroads into the TVA-area market. If TVA increases its power supply it's almost certain more industry will be coming in.

Where Now? The Administration has made a strong request that TVA be financed in the future by \$750 million in bond issues—but with some limitations that TVA supporters find distasteful.

For one thing, it would saddle the

authority with an accelerated schedule for repayment to the U.S. of the currently appropriated investment. It would also give the Secretary of the Treasury authority to fix maturity, terms and interest rates for such bonds; TVA would be required to obtain prior Congressional approval for every issue sold as a part of the \$750-million total, as well as on each individual project to be financed with money from sale of the bonds.

TVA men are bitter, particularly about the accelerated repayment schedule proposed by the Administration and also because of the attempt to put controlling authority over bond issuance in Treasury's hands. "There is only one intent in all this," says one TVA-state congressman, "and that is to force TVA power rates up."

Sen. Robert S. Kerr (D., Okla.) has introduced a bill on the subject that meets TVA's major objections. Kerr proposes to leave the controls—over both issuing bonds and spending receipts from their sale—in TVA's hands.

EXPANSION

Coal-Tar Chemicals: Koppers Co. will build two new plants for its tar products division on a 285-acre site in Arroyo, W. Va., near Chester. New units planned include a processing plant for making nicotinic acid and a development plant for upgrading coal-tar chemicals. Completion is slated for early 1957. Later, the com-

pany expects to spend several million dollars for additional new plants at the West Virginia site.

Nickel/Cobalt: Freeport Sulphur Co. plans to build an \$85-million nickel and cobalt processing plant "in one of the Gulf states." E. D. Wingfield, vice-president, said no final decision has been made on the exact location of the new plant.

Resorcinol: Heyden Chemical Corp. will build a 3-million-lbs./year resorcinol plant at Fords, N. J. Construction will begin early in 1957, with completion scheduled for December of the same year. When the new plant goes into production, Heyden will discontinue its present resorcinol unit at Garfield, N. J.

Stilbestrol: Eli Lilly plans to build a \$3.4-million manufacturing plant at its Tippecanoe Laboratories near Lafayette, Ind. On completion in late '57, the new unit will boost the company's chemical producing capacity by 50%, according to the announcement. New installations will house units for producing diethylstilbestrol and other chemicals.

Nitric Acid: New nitric acid installations for Allied Chemical's Nitrogen Division in Omaha, Neb., are scheduled to be operating this summer. The units, engineered by Chemical and Industrial Corp. (Cincinnati), won't increase Allied's over-all nitrogen capacity, but will enable Allied to produce liquid fertilizers of the ammonium nitrate and ammonium nitrate-urea types.

Sulfate Pulp: Vancouver industrialist Robert G. Campbell, plans to establish a \$60-million sulfate pulp mill in Saskatchewan's Prince Albert Forest. The company formed to operate the 210,000-tons/year mill will be known as the Waskesiu Forest Products Ltd. Construction will begin this fall, with full-scale production scheduled by 1958. An unnamed American firm will be sales agent and consumer for the entire production of the mill—and will hold the biggest block of the new company's stock.

Caustic Soda: Reynolds Metals will install a \$160,000 caustic soda re-

covery plant at its Longview, Wash., aluminum smelter to reprocess waste lime sludge. Completion is scheduled for August of this year.

Resins: At Toledo, O., Allied's Barrett Division will double its production of polyester resins, and will quadruple its phenolic resin output. The new facilities, to be brought into operation by stages, will be producing at capacity by mid-1957.

COMPANIES

Directors of U.S. Potash and Pacific Coast Borax have just agreed to merge the two companies (*CW*, May 12, p. 20), subject to stockholders'



MCA's New Chairman

NEW CHAIRMAN of the board of the Manufacturing Chemists' Assn. will be John Gillis, Monsanto's vice-president for marketing. He was elected to the post this week at the association's annual meeting at White Sulphur Springs, Va. He succeeds Goodrich Chemical's John Hoover, and will assume command July 1. Chemical industry veteran Gillis joined Monsanto in 1933, was elected vice-president in 1950, a company director in 1955. Active in economic circles, he's served with the U.S. State Dept. on economic missions and has been a director of the National Foreign Trade Council.

approval. The new company will be named the U.S. Borax & Chemical Corp.

Under the terms of the merger, U.S. Potash stockholders will be offered one share of $4\frac{1}{2}\%$, \$100 par preferred and five shares of common in the new company for each five shares of U.S. Potash they now hold. On approval of the merger, the Potash shares owned by Borax Consolidated, Ltd., will be canceled.

Union Chemical & Materials Corp. (Chicago) will offer 200,000 shares of its \$10 par common for public sale. The sale represents the holdings of four principal stockholders: Clint W. Murchison Jr. and John D. Murchison, who are selling 87,500 shares each; Murchison Trusts, 15,000 shares; and the American Agricultural Chemical Co., 10,000 shares.

Wyandotte Chemical Corp.'s first public offering was oversubscribed at a price of \$26.50/share. Proceeds from the 100,000-share (\$2.65-million) sale will be used for general corporate purposes. Chief reason for the move: creation of a public market for the shares, which until now have been held largely by descendants of the company's founder, Capt. John B. Ford.

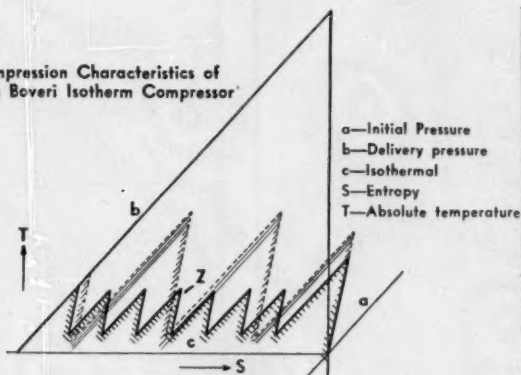
Thiokol Chemical Corp. (Trenton, N.J.) will offer 64,932 shares of stock to its present shareholders at the rate of one new share for each six held. At recent quotations for Thiokol, the offering will gross over \$2 million. Proceeds will be used to pay bank indebtedness and for new plant construction.

Incorporated: California Chemical Co., Chemical Credit & Trading Corp., Admiral Sulphur Corp. and Latino Sulphur Corp. filed charters of incorporation in Delaware last week. Authorized capital stock of the California firm is 5,000 shares, no par value. The other firms are capitalized at \$100,000, \$1.5 million and \$5,000, respectively.

FOREIGN

Ethylene Oxide/Britain: Present expansion plans for Petrochemicals Ltd.'s plant at Parington near Manchester include a new ethylene oxide unit with a capacity of 25,000 tons/year.

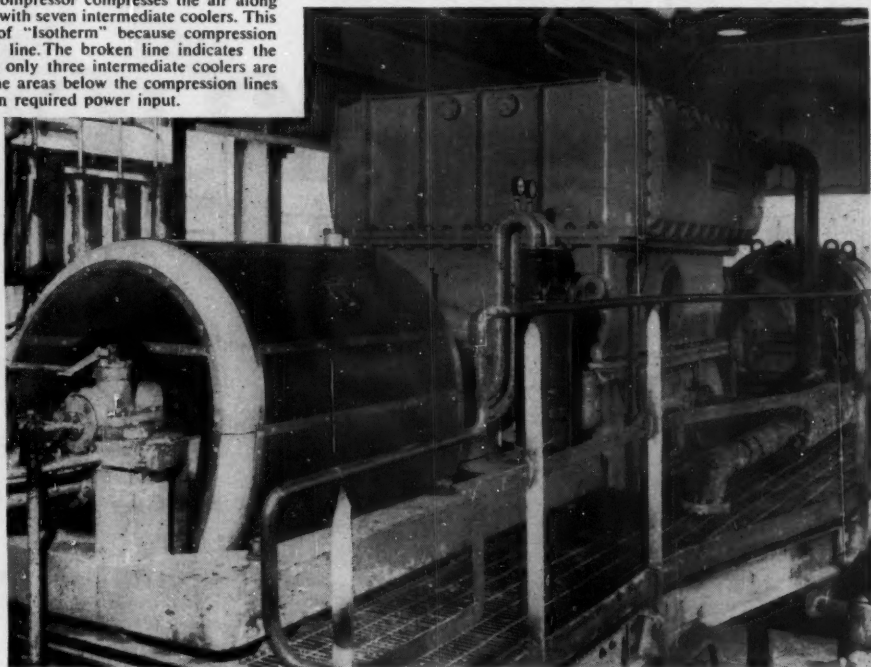
Compression Characteristics of Brown Boveri Isotherm Compressor



THE Brown Boveri Isotherm Compressor compresses the air along the solid line (Z) in nine stages with seven intermediate coolers. This arrangement justifies the name of "Isotherm" because compression approaches the ideal isothermal line. The broken line indicates the compression characteristic when only three intermediate coolers are used. The difference between the areas below the compression lines is a measure of the difference in required power input.

*it works
on
paper...*

*it
works
on
the
job...*



The 18,600 SCFM Brown Boveri Isotherm Compressor selected by the Sohio Chemical Company for their new Nitric Acid plant at Lima, Ohio, which was designed and constructed by Chemical and Industrial Corporation.

A BROWN BOVERI Isotherm Compressor unit makes possible major economies in any kind of chemical processing where large volumes of air at modest pressures is required.

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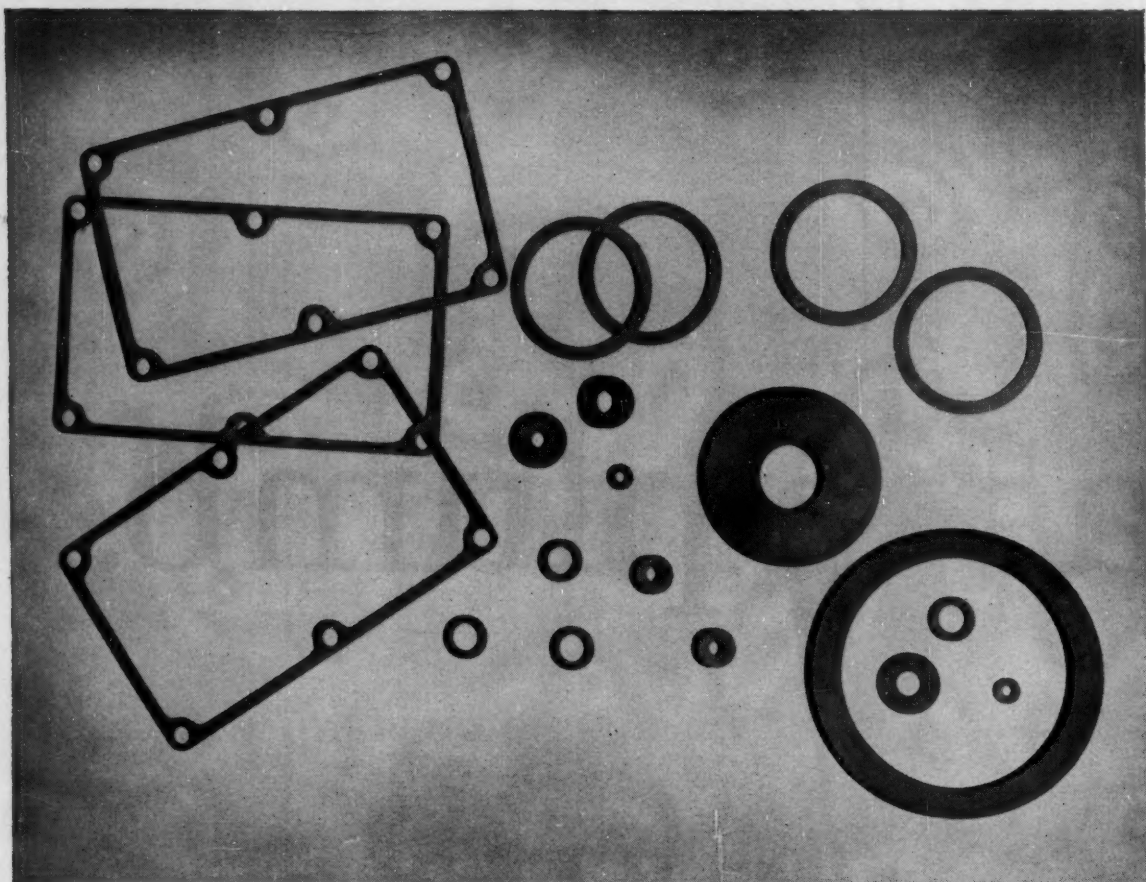
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N056-2

ADMINISTRATION



OFF THE FEDERAL ROSTER — AT LAST

- \$31.5-million alcohol-butadiene plant at Louisville, Ky. (see cover); conditionally sold last month to Union Carbide for \$3.1 million—last of the government's synthetic rubber plants.
- \$7.5-million alumina plant at Laramie, Wyo.; sold (July '55) to Ideal Cement Co. for \$1.4 million.
- Ammonia plant at Louisiana, Mo.; sold (Dec. '54) to Hercules Powder Co. for \$4.7 million.
- \$23-million chlorine caustic plant at Muscle Shoals, Ala.; sold (Dec. '54) to Diamond Alkali Corp. for \$15.1 million.
- \$3.1-million ethanol plant at Springfield, Ore.; sold (Oct. '54) to Learner Investment Co. for \$227,000.
- Oxygen plant at Rochester, N.Y.; sold (Feb. '55) to H. M. Kellner for \$80,000.

GOING: Bidding opens for Jersey oxygen plant.

GONE: Already sold, all rubber plants and these others.

Uncle Sam's Bowing Out of Chemicals

Starting next month, the U.S. government may be able to speed up the liquidation of its chemical and other manufacturing businesses; but as of this week, it still holds 29 chemical and allied products plants valued at nearly \$300 million on a cost-of-construction basis (see table, p. 28).

Most controversial of the government's chemical activities are the Navy's paintmaking shops at the Norfolk, Va., and Mare Island, Calif., Navy shipyards. What will facilitate closing down those two plants—subject to Senate concurrence—is the recent move by the House of Representatives to strike out of the 1956-57 budget bill a requirement that a federal agency must get specific permission from Congressional appropriations committees before shutting down any government operation.

Job Under Way: Some progress has been made in getting the government out of the chemical business. Since *CW* surveyed this situation two years ago (*CW*, May 15, '54, p. 20), the 27 synthetic rubber plants built by the government during World War II have been sold; six other government-owned chemical plants have gone into private ownership, (see table, above); and two more plants are up for bidding now.

But companies that feel they're

bucking governmental competition would like even faster liquidation. In the case of the paint shops, private industry is more than willing to take over that work for the Navy. Joseph Battley, president of the National Paint, Varnish & Lacquer Assn., has handed the Pentagon a detailed report on association members' ability to provide all necessary coating materials.

Besides the possibility that the Senate may refuse to go along with the House in dropping that requirement, there's another potential hitch. The House Armed Services Committee is now studying a bill (H.R. 7992) that would restrict the shutdown of Defense Dept. industrial-type facilities employing a certain minimum number (not yet determined) of civilians. However, in view of the action by the House as a whole in killing the broader restriction, it's doubtful that this bill will get out of committee.

Many Still Operating: A number of the government's chemical plants are almost in private status, having been leased to private concerns—sometimes under a clause that binds the company to restore the plant to wartime production in the case of national emergency. Such a clause also appears in some of the contracts for sale of plants.

But many of the government's chemical facilities are still in actual daily operation. The U.S. Bureau of the Budget groups these in-use holdings into two categories: government-owned and operated; and government-owned, contractor-operated. In the chemicals and allied products field, there are now 29 such units, all held by the Defense Dept.

Seventeen of those facilities are in the first category. Except for one Army-operated explosives plant, these are all very small operations, with combined capital assets of \$4.7 million and with total employment of only 187 civilians and two military men. In the second category are 12 contractor-operated installations, all making explosives. These are relatively big plants, averaging nearly \$100 million apiece in capital assets.

Assistant Secretary of Defense Thomas Pike has complained to Congress that the Pentagon's efforts to eliminate "unnecessary commercial and industrial activities" have been "impeded and delayed" by that rider in the 1955-56 appropriations bill. Now that this hindrance has been scrapped—by the House, at least—you should soon see more progress toward getting the government out of the chemical business.

STILL ON GOVERNMENT'S BOOKS

(Chemical Plants Owned by U.S. Government as of June 1)

Chemicals

Products	Location	Cost	Status and Outlook
Ammonia	Dumas, Tex.	————	Leased to Phillips Chemical
Ammonia	San Jacinto, Tex.	————	Leased to San Jacinto Chemical
Ammonia, organics	Morgantown, W. Va.	————	Leased to Olin Mathieson
Calcium carbide	Ashtabula, O.	\$3,200,000	Auctioned March 31, 1956; high bid by State Metals & Steel Co., Canton, O.; no decision yet on award
Chlorine, caustic	Lake Charles, La.	21,400,000	Leased to Columbia-Southern
Ethanol (fermentation process)	Omaha, Neb.	6,200,000	Inactive; sale held up pending action on bill to transfer of plant to Agriculture Dept. for converting excess grains into alcohol
Hydrogen peroxide	Niagara Falls, N.Y.		Maintained by Olin Mathieson

Metals and Ores

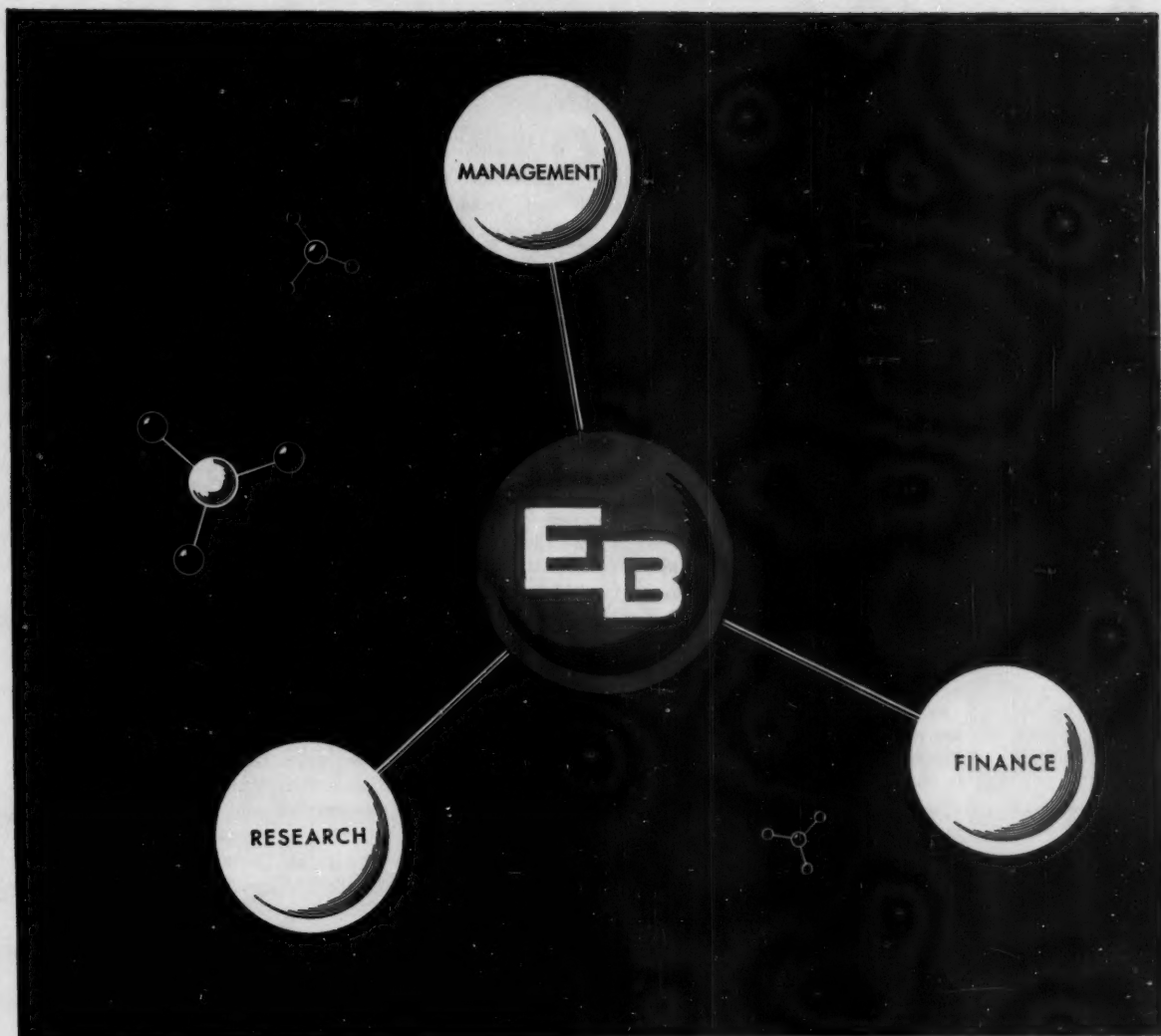
Magnesium	Canaan, Conn.	5,000,000	Leased to AEC, which subleases to New England Lime for production of calcium and magnesium for AEC
Magnesium	Luckey, O.	4,300,000	60% of plant leased to AEC for beryllium production; contract renewable to 1964; magnesium facilities to remain
Magnesium	Manteca, Calif.	5,800,000	Western Puromet has permit to use plant for titanium research
Magnesium	Painesville, O.	36,000,000	Idle; GSA unable to find buyer
Magnesium	Spokane, Wash.	17,000,000	95% of plant leased until 1963 to Pacific Northwest Alloys for ferrochrome production; lessee may renew or purchase
Magnesium	Velasco, Tex.	26,500,000	Operated for GSA by Dow; most of production goes into government stockpile
Magnesium	Wingdale, N.Y.	6,000,000	Inactive
Nickel Oxide	Nicar, Oriente, Cuba	32,000,000	Operated for GSA by National Lead Co. subsidiary

Industrial Gases

Oxygen	Gloucester, N.J.	228,000	To be reoffered for sale after refusal of \$50,050 bid (May 11) by National Cylinder Gas Co.
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Explosives and Munitions

Ammonium picrate	Little Rock, Ark.	————	Inactive
Pentolite, TNT, DNT	Sandusky, O.	31,400,000	Inactive
TNT	Meadville, Pa.	31,000,000	Inactive
TNT, DNT	Weldon Springs, Mo.	10,400,000	Inactive
TNT, DPA, DMR, powder	Pryor, Okla.	31,000,000	Inactive
TNT, Teteryl	Sylacauga, Ala.		Inactive
Weapon chemicals, such as hexachlorethane	New Martinsville, W. Va.		Inactive



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VANADIUM VENDETTA: 32-YEAR PLAYBACK

- 1924—U.S. Vanadium Co. built mill and began processing vanadium ore near Rifle, Colo.
- 1926—U. S. Vanadium acquired by Union Carbide and Carbon Corp.
- 1933—Alleged collusion between U. S. Vanadium and Vanadium Corp. of America.
- 1942-45—Defendant companies bought and processed uranium and vanadium ores for U.S. Army's atomic bomb project.
- 1946—Six corporations and five executives indicted by federal grand jury at Denver on charges of conspiracy to fix prices and monopolize the industry.
- 1948—U. S. Dept. of Justice dropped that indictment and instead filed "criminal information" proceeding against Vanadium Corp. of America, Union Carbide, and three Carbide subsidiaries: U. S. Vanadium, Electro Metallurgical Co., and Electro Metallurgical Sales Corp.
- 1949-55—In series of reorganization moves, Union Carbide's defendant subsidiaries were merged into parent company as operating divisions, with Electro Metallurgical Co. taking over U. S. Vanadium assets and functions.
- 1954—U. S. District Court at Denver granted Carbide's motion for dismissal of charges against Carbide's three former subsidiaries.
- 1956—U.S. Court of Appeals at Denver upheld dismissal of charges against U. S. Vanadium and Electro Metallurgical Co. (had been incorporated in Delaware and West Virginia) ; but told the district court to reinstate the charges against Electro Metallurgical Sales Corp. (had been incorporated in New York).
- 1956—U. S. Supreme Court turns down appeals by both Carbide and the Dept. of Justice, refuses to upset the decision by the Court of Appeals.

a dissolved company (although allowing "corporate existence" to run for some period after dissolution for certain purposes, such as to wind up civil litigation).

Both sides appealed from this ruling. The government's Antitrust Division wanted the Supreme Court to upset the ruling on Electro Met and U.S. Vanadium, while Carbide asked for reversal of the decision on Electro Metallurgical Sales.

Atomic Secrecy Involved: The case originated in 1946 when a federal grand jury in Denver returned an indictment against most of the big names in the vanadium field: Vanadium Corp. of America, Union Carbide and four of its metals and alloys subsidiaries, and five executives of those concerns. Allegations were that Vanadium Corp. and U.S. Vanadium had been trying to control markets and prices since 1933, when the former cut down its vanadium ore imports from Peru; and that these concerns had misused their positions as agents of the government during World War II when they were buying and processing uranium and vanadium ores for the Army's "Manhattan District."

This action alarmed the U.S. Atomic Energy Commission, which feared that the evidence likely to be aired in trial of the suit would disclose top-secret figures on uranium production. Because of that national security angle, the Justice Dept. two years later dropped the indictment and started a new case limited to charges of monopoly and price-fixing on vanadium and its products.

In fighting against the dismissal rulings, the government hasn't challenged Carbide's good faith in the dissolution and mergers. On the contrary, the Justice Dept. concedes that those moves were based on business considerations having nothing to do with the antitrust case.

As things stand now, the suit is still pending in U.S. District Court at Denver against Vanadium Corp. of America and Union Carbide, as well as against Carbide's nonexistent former subsidiary, Electro Metallurgical Sales Corp.

But much of what the government had intended to offer as evidence pertained to the two subsidiaries that are now out of court as well as out of business, so there's now more likelihood of consent settlement.

Gunning for 'Ghost' Firms

For chemical management men contemplating corporate reorganization plans, there may be a useful lesson in last week's action by the U.S. Supreme Court in an antitrust case against the country's major producers of vanadium.

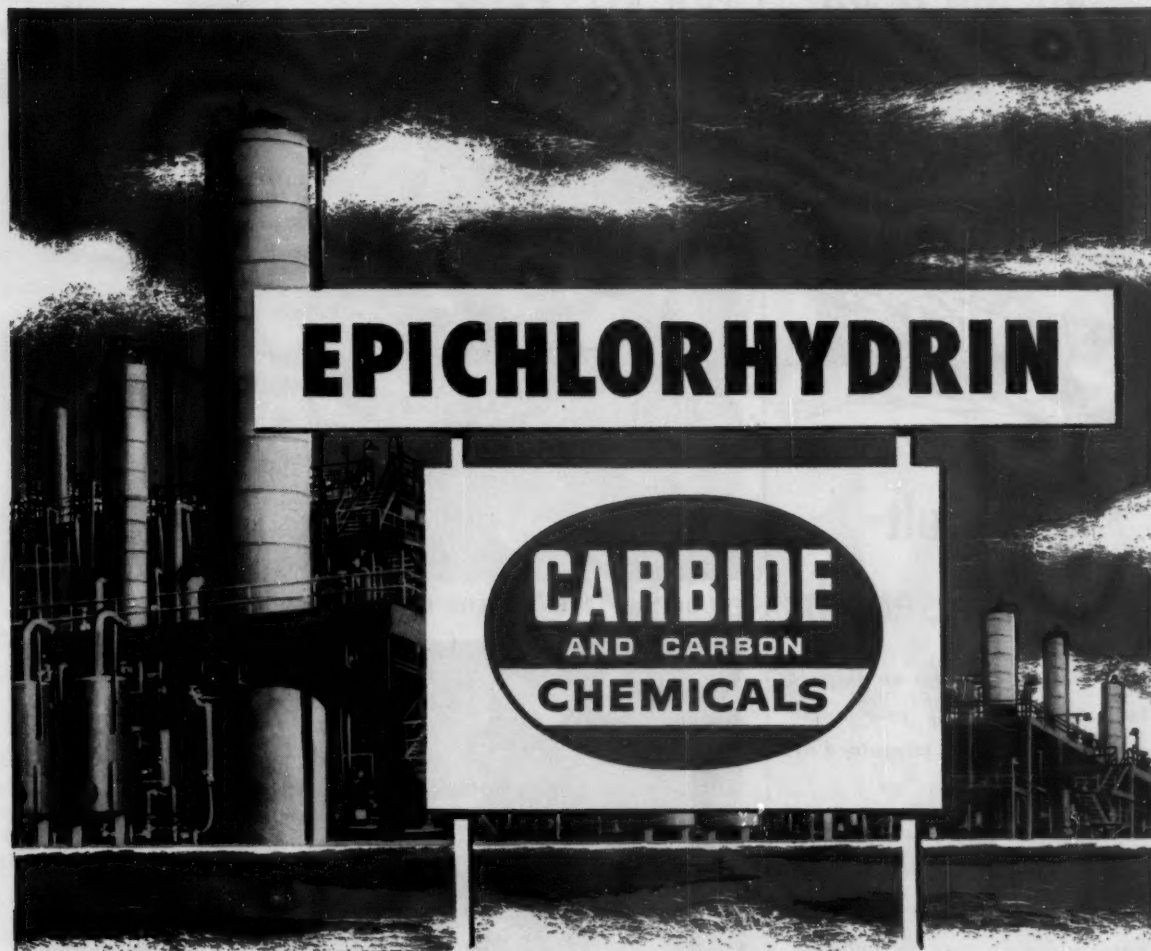
The high court turned deaf ears to the pleas of both the Dept. of Justice and Union Carbide and Carbon Corp., refused to upset a circuit court ruling in a 10-year-old dispute over vanadium pricing and trading practices.

Immediate issue: What happens to antitrust charges against companies or subsidiaries dissolved by merger?

State Laws Govern: In the vanadium case, the trial court seemed to feel that dissolution of a defendant company should automatically lead to dissolution of criminal charges against that concern. But the circuit court ruled—and the Supreme Court appears to agree—that it all depends on the laws of the state in which the company was incorporated.

On this basis, the Court of Appeals at Denver earlier this year sustained the district court's dismissal of charges against two former Carbide subsidiaries that have now been absorbed into the parent company, Electro Metallurgical Co. and U.S. Vanadium Corp.; but the district court was ordered to go ahead with proceedings against a third Carbide subsidiary, Electro Metallurgical Sales Corp., which also has been merged into Carbide's corporate structure.

Reasoning: up to the time they were taken into the parent company, Electro Met and U.S. Vanadium were incorporated in West Virginia and Delaware, respectively, and Electro Metallurgical Sales was incorporated in New York. The Court of Appeals construed New York law as permitting both civil and criminal lawsuits to continue after dissolution; but it interpreted West Virginia and Delaware business laws as not permitting criminal actions to continue against



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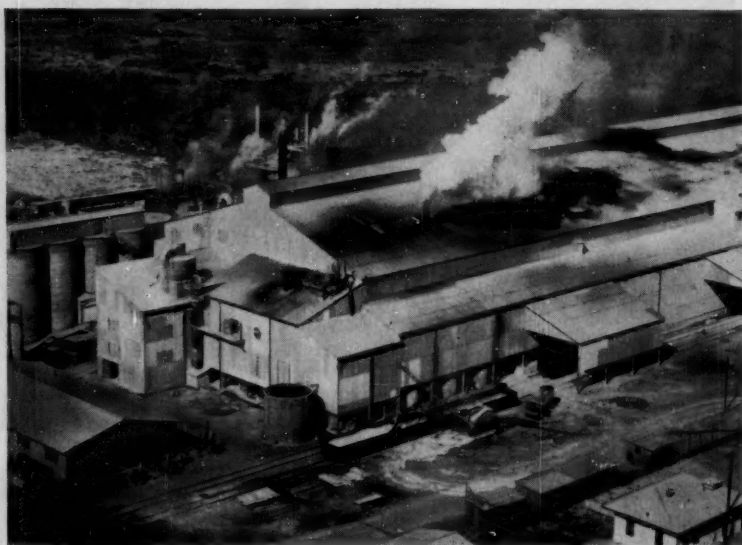
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ADMINISTRATION



FLUORINE FUMES ON THE FLY: Phosphate plants face injunction suits.



CHLORINE UNDER CONTROL: APCA delegates see a plant* in the clear.

Strong Stand for Standards

A glance at the week's news items helps explain why chemical industry management—despite all it has spent to curb air and stream pollution from chemical process plants—took a prominent part in the Air Pollution Control Assn.'s 49th annual meeting last week in Buffalo:

- At San Francisco, a U. S. Court of Appeals has ordered Reynolds Metals Co. to pay \$91,000 to an Oregon farm family for alleged damage by fluorine-containing plant fumes to lands and livestock during a four-year period; and at Portland, Ore., trial is starting in another civil suit

against Reynolds, with a suburban dairy asking \$150,000 for alleged damage to a herd of 500 cows and \$400,000 for asserted loss of milk production over an eight-year period.

- A Florida legislative committee—prodded by citrus growers and cattlemen who say they're "desperate" and are thinking of taking Polk county's big phosphate producers into federal court over alleged damage by hydrofluoric acid fumes—is drawing up recommendations on more stringent pollution control laws.

*Guiding one of the chemical plant tours during last week's sessions, Thomas Bacon of Hooker Electrochemical's process study group.

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ADMINISTRATION

• Gov. Arthur Langlie of Washington—after a protest meeting in which the Olympia Oyster Growers' Assn. (1) accused Rayonier of seriously damaging their industry by dumping sulfite liquor into Puget Sound; and (2) charged that the Washington State Pollution Control Commission has been "dodging the issue"—is putting pressure on all parties to work out a solution.

Question of Standards: Confronted by such strident demands for abatement or compensation, chemical process people are putting in more time and effort on pollution problems than ever before. This was apparent at the APCA meeting, at which the chemical industry gave far more papers than any other industry. Represented: Du Pont, Union Carbide, Allied Chemical & Dye, Monsanto, American Cyanamid, Hooker Electrochemical, Pennsylvania Salt, Victor, Goodrich Gulf, and Barnebey-Cheney.

Along with reports on technical advances in pollution control, the speakers from chemical companies gave figures on the scope of the problem and the costs involved, and took a strong stand for "reasonable and practical standards" as a guide in abatement efforts and a limit on expenditures. In recognition of their mutual interest in establishing such standards, APCA and the Manufacturing Chemists' Assn. held a joint session on "The Chemical Industry's Approach to Air Pollution Problems."

Crackdown Coming: Aside from the tiffs involving the aluminum, phosphate and wood pulp producers, there are plenty of other indications that more severity is to be expected in this field. At Chicago, Cook County officials are warning that companies or individuals polluting local streams will face criminal prosecution; the U. S. Supreme Court has refused to overturn a California state law—attacked by an oil company as being too vague and indefinite—that prohibits gaseous discharges of a certain opacity; Gov. G. Mennen Williams has told the Michigan legislature that the state health department should be granted "authority and manpower to deal more effectively with air pollution."

Industry is not sitting still. One APCA speaker cited an estimate that annual expenditure for air pollution control equipment in the U. S. is about \$500 million. Sometimes pollution abatement can be profitable; at Wilmington, Calif., Hancock Chemical is building a \$1.5-million plant to recover sulfur from waste refinery gases, and Stauffer Chemical is planning an additional unit to convert that sulfur into acid. And in many places, abatement programs have been highly successful. For example, the industry's air pollution control job at Beaumont, Tex., which last fortnight drew a verdict of "excellent" from Andrew Rose, chief engineer of the U. S. Public Health Service's Robert A. Taft Sanitary Engineering Center at Cincinnati.



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Heavy Minerals' deposits contain a number of heavier rare earths including europium, gadolinium and yttrium, many of which are considered important in nuclear development.

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ADMINISTRATION



WIDE WORLD

SECRETARY WEEKS: In merger bill, he assails clause for 90-day wait.

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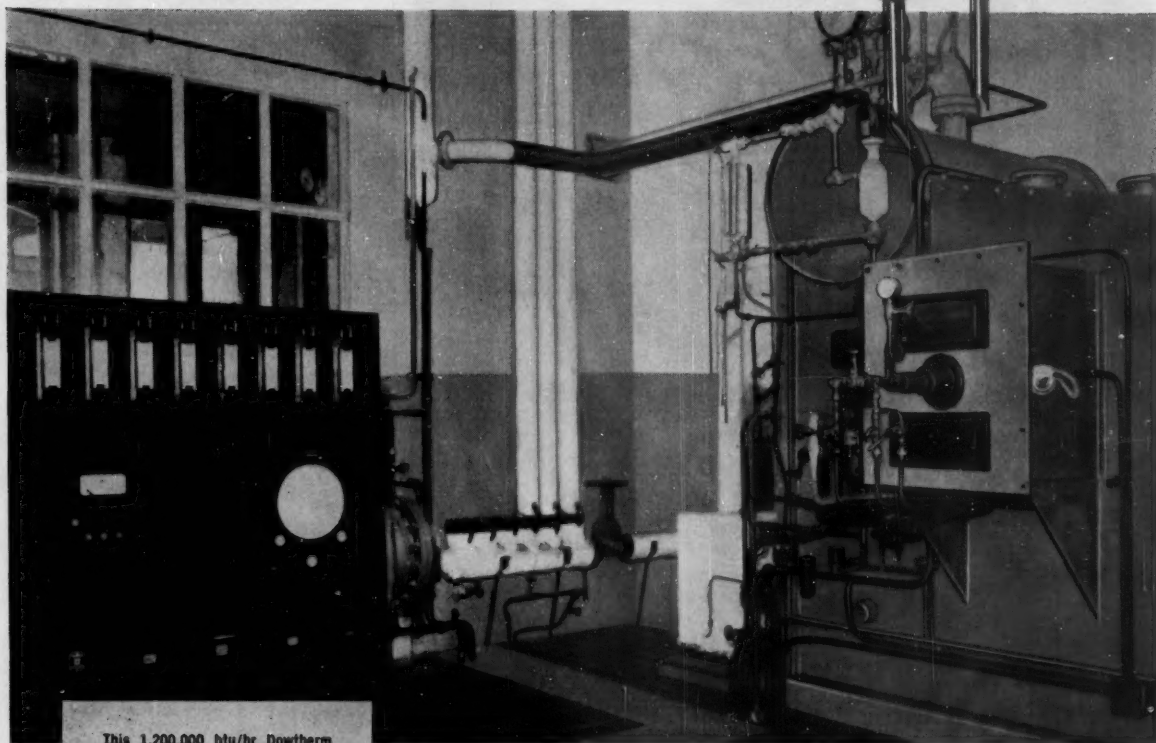
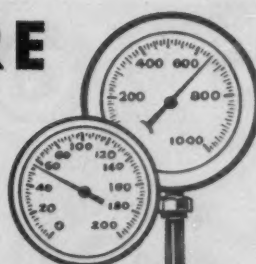
'Unfair to Business': If there's a merger in your future, you may have a stake in Commerce Secretary Sinclair Weeks' attempt to alter the anti-merger bill that—with Justice Dept. backing—has cleared the House and is now pending in the Senate. Weeks says he approves the general idea of stopping an illegal merger before it's consummated, but says the proposed 90-day waiting period and other provisions of the bill as it now stands are unfair to business. Weeks also feels that the Justice Dept. should be required to render an opinion on the legality of a proposed merger if the companies concerned request it.

For Pipeline's Pictures: The lawsuit threatening to delay construction of the Pacific Northwest Pipeline Corp.'s natural gas pipeline to Seattle and vicinity appears to have ended in an out-of-court settlement between PNPC and property owner Thomas Cowan. In fighting the company's action to condemn a strip of his property for pipeline right-of-way, Cowan had demanded that he be allowed to see and copy the company's pictures showing effects of a recent pipeline explosion near Moab, Utah. Judge Malcolm Douglas granted Cowan's request, but excoriated the Oil Heat Institute—accused by PNPC of instigating Cowan's lawsuit—for its tactics in opposing the pipeline.

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ADMINISTRATION

LABOR

Restless on Wage Gap: The Oil, Chemical & Atomic Workers Union (AFL-CIO), it appears this week, may be about to fulfill expectations that it would sooner or later try to do something about the fact that oil industry wages are higher than chemical pay rates. Indication that OCAW's chemical members are getting restless about this wage gap came last month at Toronto during a conference of OCAW's Canadian locals. In a "continuing wage policy" adopted by the delegates, they instructed District Director Neil Reimer and his staff to work for "closing of the gap in wage rates between the oil, chemical and utility sections of our jurisdiction." They also called for elimination of the gap between Canadian and U.S. wages in the oil and chemical industries, and invited the Canadian section of the International Chemical Workers Union (AFL-CIO) to cooperate in these efforts. Reimer, incidentally, has been elected one of the 13 vice-presidents in the Canadian Labor Congress, formed through the recent merger of two formerly hostile labor groups.

Squibb Strike Ends: A two-year contract providing for a 9¢/hour wage rise retroactive to May 5 and an additional 6¢ next May settled OCAW's strike at three plants of Olin Mathieson's E. R. Squibb Division after 17 days. The strike was probably the first in support of an OCAW "company



OCAW'S REIMER: In Canada, his union asks oil-chemical wage parity.

CYANAMID

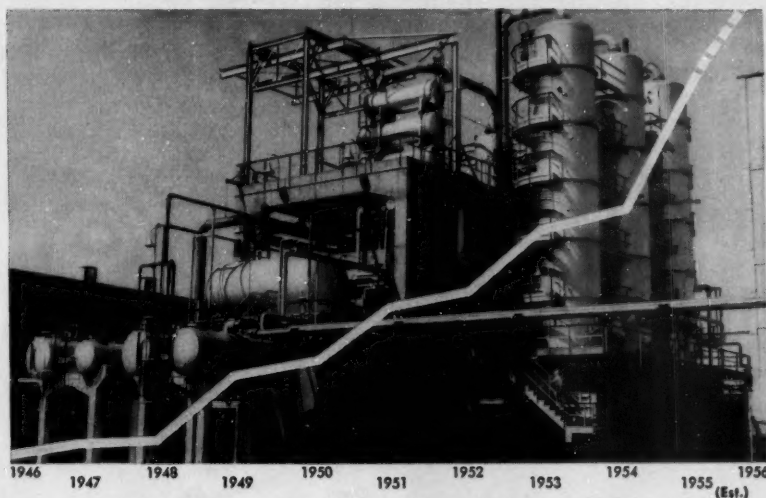
PETROCHEM LINES

NO. 3
OF A SERIES

Published by AMERICAN CYANAMID COMPANY, Petrochemicals Department

30 Rockefeller Plaza, New York 20, N.Y.

Acrylonitrile in Rubber



Graph shows increase in U. S. nitrile rubber production from 5738 long tons in 1946 to 30,000 long tons (est.) in 1955. (Source: Dept. of Commerce)

Rubber products made from acrylonitrile-butadiene copolymers were the first commercial outlet for acrylonitrile and still remain one of the most important end uses.

These rubbers are generally made from copolymers containing 15 to 40% acrylonitrile, and possess excellent resistance against solvents, oils and greases. In addition, they are resistant to degradation from heat, aging and sunlight. Different methods of compounding produce a variety of rubbers having high tensile strength, excellent elongation and low compression set.

Maximum values for all these properties cannot be obtained in a single rubber, but proper mixing and compounding techniques produce rubbers ideally suited for specific applications. These applications include the use of acrylonitrile-butadiene rubbers in linings for fuel tanks...hoses...pump and valve linings...shock absorbers...conveyor belting...plumbing accessories...non-slip, non-marking soles and heels...protective clothing.

The properties of acrylonitrile-

butadiene rubbers can be modified by blending, before vulcanization, with natural polymers, or synthetic polymers such as chloroprene and acrylic esters.

Acrylonitrile-butadiene copolymers can be compounded into either hard or sponge rubbers. It is even possible to produce a rubber which is both hard and cellular. This material weighs only 6-8 pounds per cubic foot, yet it has a compression strength of several hundred pounds per square inch. Its strength-to-weight ratio is one of the highest among commercial materials. It does not absorb water, oil or gasoline and it withstands temperatures of 200°F. These properties make it particularly valuable as an insulating material against heat, sound and electricity.

An extremely interesting discussion of acrylonitrile-butadiene copolymers is presented in the "Transactions of the Institute of the Rubber Industry." We have reprinted this excellent article and will gladly send you a copy upon request.

Copolymerization of Acrylonitrile

Acrylonitrile copolymerizations ordinarily produce heterogeneous mixtures of chains varying both in composition and length. When this distribution is too broad, certain fractions become incompatible with the rest and the product is weak and opaque.

A narrow spread in composition may be obtained by adjusting the monomer concentration on the basis of calculations made using experimentally determined reactivity ratios. These ratios indicate the propensity of a chain ending in an acrylonitrile molecule to react with another molecule of acrylonitrile, and therefore they increase with increasing preference for self-polymerization.

Structural variations of acrylonitrile copolymers can be achieved by using special techniques. For example, "block" copolymers may be obtained by running polymerizing chains of acrylonitrile into styrene. "Graft" copolymers have been obtained by heating polyacrylonitrile latex with vinyl acetate monomer in the presence of potassium persulfate.

The copolymerization of acrylonitrile is discussed more thoroughly in our Technical Bulletin, "Polymers and Copolymers of Acrylonitrile." Write for your copy today.

Acryo-News Excerpts

U. S. Patent 2,723,254 — "Copolymers of acrylonitrile and N-substituted sulfonamides."

U. S. Patent 2,733,226 — "Triallyl phosphite stabilizers for synthetic rubbers."

Brit. Patent 744,328 — "Copolymerizing butadiene and acrylonitrile."

Fr. Pat. 1,110,087 — "Copolymers of acrylonitrile and allyl morpholine and the process for their production."

Write for continuing bibliography of acrylonitrile references.

Note: The foregoing shall not be construed to imply the non-existence of any relevant patents nor to constitute a permission, inducement or recommendation to practice any invention covered by any patent owned by American Cyanamid or by others, without authority from the owner of the patent.



IN ADDITION TO **HARSHAW** BORON TRIFLUORIDE HYDROFLUORIC ACID *anhydrous . . . aqueous*

***Here are many more production-
controlled, high-quality fluorides:***

Ammonium Bifluoride	Hydrofluoric Acid
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Antimony Trifluoride	Hydrofluosilicic Acid
Sublimed	Lead Fluoborate
Barium Fluoride	Metallic Fluoborates
Bismuth Fluoride	Potassium Bifluoride
Boron Trifluoride	Potassium Chromium
Boron Trifluoride	Fluoride
Complexes	Potassium Fluoborate
Chromium Fluoride	Potassium Fluoride
Copper Fluoborate	Potassium Titanium
Fluoboric Acid	Fluoride
Fluorine Cells	Silico Fluorides
Fluorinating Agents	Sodium Fluoborate
Frosting Mixtures	Tin Fluoborate
Hydrofluoric Acid	Zinc Fluoborate
Anhydrous	Zinc Fluoride

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Harshaw's 40-page Book
on Hydrofluoric Acid
Anhydrous. It provides
helpful data.

ADMINISTRATION

council," in which several local unions set up a joint bargaining committee. Other benefits covered by the new agreement include one additional paid holiday, company payment of surgical insurance premiums, and apprentice training.

Rubber Wage Parleys: Besides whatever new pay rates go into effect in the steel industry, another factor in the background of future chemical wage bargaining will be the outcome of soon-to-be-held parleys between representatives of the United Rubber Workers (AFL-CIO) and the five largest rubber companies. URW has said it wants "substantial" but unspecified wage increases this year.

KEY CHANGES

James E. Shields, to president; **George A. MacCartney**, to vice-president; **Clarence A. Weltman**, to vice-president and technical director in charge of operations, Alox Corp (Niagara Falls, N.Y.).

Frank J. Pollnow, Jr., to president, Vestal Laboratories, Inc. (St. Louis).

Stuart C. Dorman, to president; **Harvey D. McLean**, to treasurer; **Joseph F. Patten**, to secretary, Gulf Sulphur Corp. (Houston).

Charles E. Brown, to executive vice-president, Chemstone Corp. (Cleveland).

Claud Brown, to vice-president, Interchemical Corp. (New York).

Forbes K. Wilson, to assistant vice-president, Freeport Sulphur Co. (New York).

Robert H. Wise, to comptroller, Goodrich-Gulf Chemicals, Inc. (Cleveland).

Edward J. Massaglia, to general manager for operations, chemical division of Atlas Powder Co. (Wilmington, Del.).

A. N. Wohlwend, to director of commercial development, Escambia Bay Chemical Corp. (Cambridge, Mass.).

DIED

Norman J. Burd, 48, vice-president and director of manufacturing, Norwich Pharmacal Co. (Norwich, N.Y.), at Ft. Lauderdale, Fla.

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...for mixing powders pastes and liquids

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Titanium Pigment Corporation is a subsidiary of National Lead Company

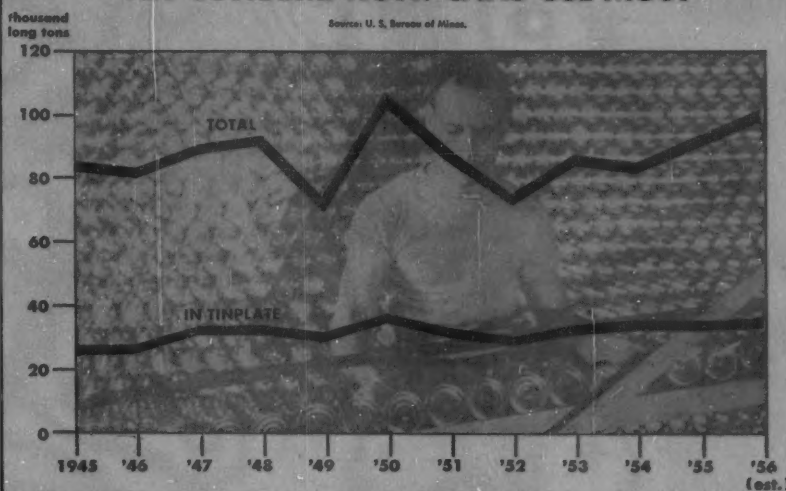
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Charting Business

CHEMICAL WEEK

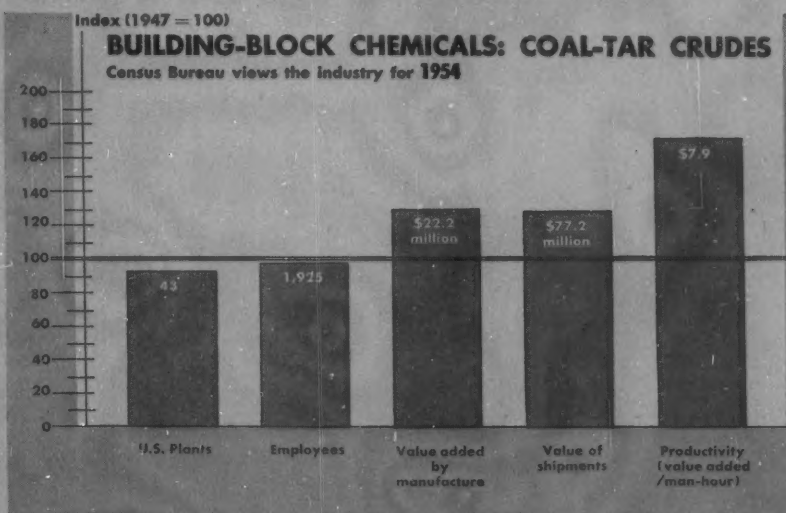
June 9, 1956

TIN CONSUMPTION: CANS USE MOST



BECAUSE they depend so heavily on tin imports, canmakers continue to strive for reduced consumption of tin in tinplate manufacture. Currently, about 37% of the total tin consumed in the U.S. ends up as tinplate; 90% of the tinplate goes into cans. Significant trends:

despite the likelihood of a 5% increase this year in amount of can units produced (now hovering around 35 billion/year), total tin consumption by the industry is leveling off. Reason: tin cans today take only 11 lbs. (formerly 35 lbs.) of primary tin per ton of steel.

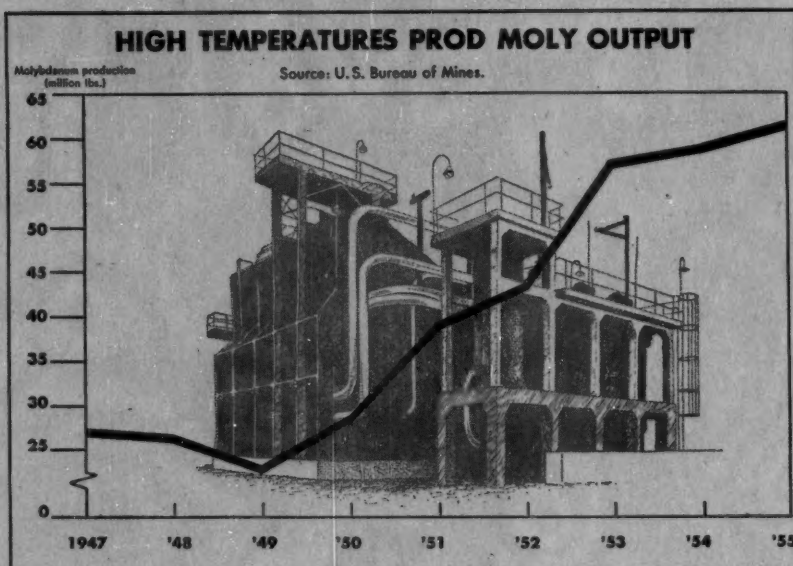


EVEN WITH four fewer plants in Northern regions and one more in the South (according to latest government Census of Manufactures figures, 1954 vs. 1947), the basic coal-tar crudes industry continues to register steady gains—especially in productivity. Of the \$77

million worth of products shipped in 1954—up 27% over 1947—\$63 million (82%) were basic cyclic crudes. This includes such materials as: light oils, benzene, toluene, naphthalene, anthracene, xylene, and solvent naphtha—building blocks for a string of chemical industries.

Charting Business

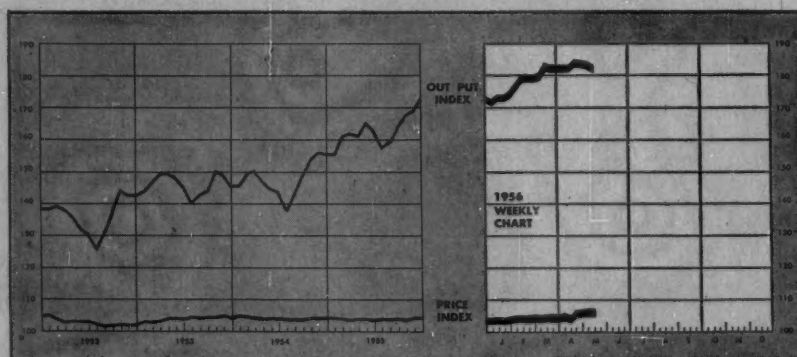
(Continued)



AS TECHNOLOGIES in widely diversified fields demand higher and higher temperatures, molybdenum's plus factors (melting point: 4,750 F; thermal conductivity twice that of iron) are currently pushing production of concentrates close to the 65-million-lbs./year mark.

Iron and steel industries now consume over 90% of moly's production in ferro-alloys; the paint industry takes about 2%. One important chemical industry application: in materials of construction for high-temperature ethane-to-ethylene cracking plants (like that shown above).

BUSINESS INDICATORS



WEEKLY

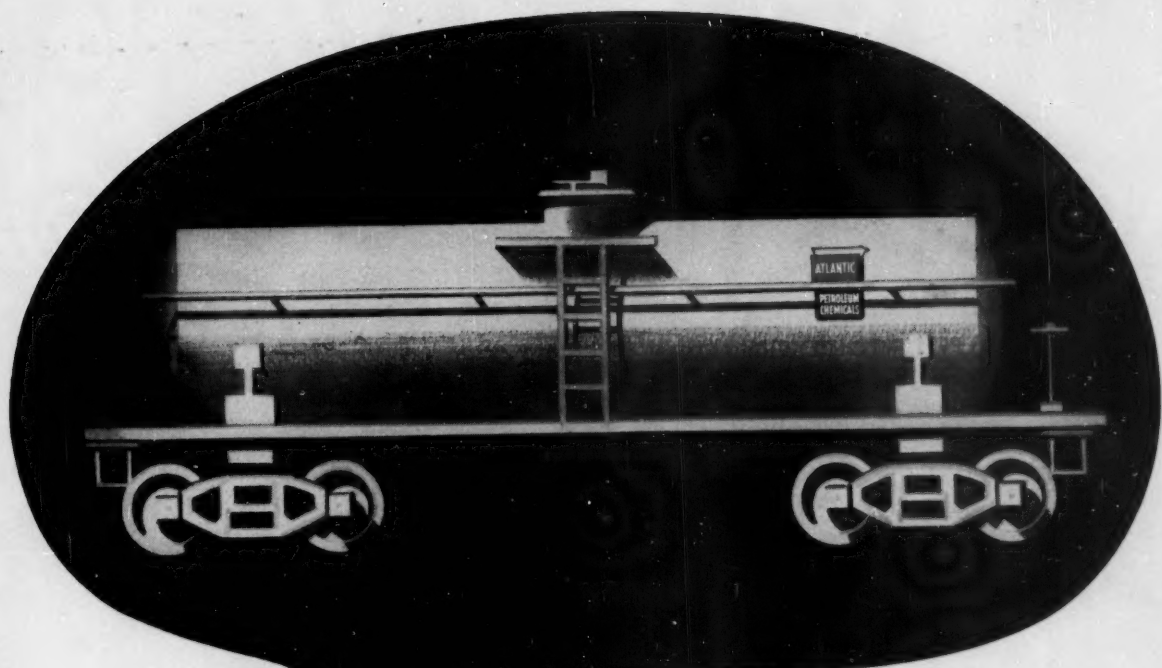
Chemical Week Output Index (1947-49=100)
 Chemical Week Wholesale Price Index (1947=100)
 Stock Price Index of 11 Chemical Companies
 (Standard & Poor's Corp.)

Latest Week	Preceding Week	Year Ago
180.3	181.1	166.5
105.7	105.8	104.2
461.0	460.9	419.5

MONTHLY

Production (Index 1947-49=100)
 All Manufacturing and Mining
 All Chemical Products
 Industrial Chemicals

Latest Month	Preceding Month	Year Ago
143	143	138
178	180	165
200	202	182



HOW TO CUT COSTS ON DETERGENTS

More and more consumers are making substantial savings on their purchases of alkyl aryl sulfonates by specifying Atlantic Ultrawets in bulk quantities.

Bulk purchases call for storage facilities. Atlantic has developed suggestions to help you. They include alloys, coatings, equipment, piping layout, and estimated costs.

Atlantic is ready to offer on-the-spot assistance to help you with your bulk storage problems.

Write for information on your company letterhead regarding suggested bulk storage facilities for liquid Ultrawets. The Atlantic Refining Company, Dept. H-6, Chemical Products Sales, 260 S. Broad Street, Philadelphia 1, Pa.



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The **ULTRAWETS** wet,
penetrate, clean, emulsify



SPECIALTIES

OLD VARIATIONS ON A NEW THEME

Lever presents Wisk as a new kind of product, minimizes its roots in powder detergents. It stresses advantages over powders: it is an all purpose detergent, rinses away better, can be used concentrated to remove stains, wash walls or clothes.



Procter & Gamble, on the other hand, sells Biz more as a new model of old detergents, just another brand. The package is reminiscent of Tide, as are the claims: washes clothes whiter, with ease and economy.

Biz stresses penetration qualities with diagram, repeated use of phrase "surges through clothes".

PROCTER & GAMBLE ANNOUNCES
New Liquid for Laundry!
Instantly generates
a new world of Washing Power



Note use of the word "whitest," rather than "cleaner." Actually, the liquids don't clean quite as well as powders, are loaded with optical brighteners.

Unlike Biz, Wisk stresses "all-purpose" qualities, can be used for dishes, stoves, laundry, delicate fabrics. Wisk is the only one which suggests use of the concentrated product for removal of difficult spots.

Both denounce old forms, saying "You'll never go back to powdered detergents".

"Wisk-it's wonderful!"

Both sell convenience of package and no-measure qualities.

Fluid Drive Powers Soapers' '56 Push

Sales of soaps and detergents for the first quarter of '56 are up 13% over the same period last year,* and as the stakes go up, the fight gets rougher. Hardest fought of all is the battle among makers of synthetic detergents, whose 69% of the market is half-owned by Procter & Gamble. Other firms, hoping to shake P&G loose from a little of this, are placing their heaviest bets on liquid detergents—which are now doing 95% better than a year ago.

But P&G is fighting back. To counter Lever Brothers' Wisk, P&G has just introduced its own liquid Biz (CW Business Newsletter, May 26) into three test markets—Evansville, Ind., Springfield, Mo., and Grand Rapids, Mich. Pioneered by Armour's Gee, the heavy-duty liquid detergent business is rapidly moving beyond the reach of small advertising budgets.

* From the Assn. of American Soap & Glycerine Producers, Inc.

Armour, unable to overcome product problems fast enough to stay in the race, has dropped out, must await another chance to move into the area of broad-based "big soap."

More than Three? At first glance, the soap industry might look much like the auto industry—one big giant and two smaller giants battling it out. A closer look, however, reveals an important difference. Whereas auto firms below the giant level are on shaky ground and offer little competition to the "Big Three," the smaller companies in soap are a threat.

Spectacular example: Armour's Dial toilet bar. Dial not only broke into the tight toilet bar business (and with a premium-priced product), but also the company now claims that last year it achieved the No. 1 position, in both dollar volume and tonnage.

Sweetheart Marries: Also breaking into the toilet bar business this week is California's 30-year-old Purex Corp.

Ltd. (Southgate, Calif.). The firm already makes a liquid bleach, heavy-duty dry Beads-o-Bleach, a perborate bleach, a light-duty detergent and—by recent purchase—Dutch Cleanser. Now, Purex has bought the Manhattan Soap Co. (New York), maker of Sweetheart Soap, a toilet bar that has been in national distribution since 1890. Currently, Sweetheart has about 7% of toilet bar sales, a respectable figure considering that Dial, Ivory and Lux have only 12-13% each.

With Manhattan, Purex will also get a bluing product—Blu-White—and a now-in-test-market deodorant bar called Protex. In all, this will be a sizable jump forward for fast-growing Purex. Manhattan's \$12-14-million annual sales, added to Purex's \$35-36-million, should make a business in the neighborhood of \$50 million.

This, however, still leaves a considerable gap between Purex and soap's giants—P&G has \$966 million total

in Chemical Plant Construction
INGENUITY IN THE FIELD
makes the difference!



DOMINICAN REPUBLIC



Modern Plant of
 Central Romana By-products Co., Inc.
 in Dominican Republic

ASSIGNMENT:

Build a plant for producing profitable chemicals from wastes at sugar-mill site in West Indies.

SPECIAL PROBLEM:

Job-site training of Dominican workers in construction skills plus use of limited available materials and equipment.

RESULT:

On-schedule startup at below-estimate cost.

Recently at a sugar-mill site in the Dominican Republic Vulcan Construction Division assisted in the construction of a processing plant for the production of valuable chemicals from waste bagasse. Vulcan Construction experts on the job made every minute and every man count. With a small U.S. crew, Dominican workers were trained to high-skill levels in welding, brazing, forming, fitting, handling and placing heavy process equipment. Distillation towers, condensers, exchangers, pumps and process and service piping were assembled and installed at the plant site. Ox-carts were used to haul materials within the construction area! In spite of obstacles, Vulcan completed the job on time at a below-estimate cost.

Let us bid on your next job and learn for yourself the important value of sound experience combined with practical ingenuity in the field—all backed by an organization with 55 years in designing and building chemical plants and equipment. It's a combination which can make the difference between confusion and costly delay—and on-time, on-budget completion.

**VULCAN CONSTRUCTION
 DIVISION OFFERS:**

- Overall plant construction services including site preparation, foundations, structural steel, buildings, equipment erection, machinery setting, piping, instrumentation, electrical work, insulation and painting.
- Renovation of existing plants both large and small.
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INHIBITORS

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Waxes

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Calcium
Chloride

SALICYLIC
ACID

GUM ARABIC

Umbers

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Citric
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BLACK LEAD
(GRAPHITE)

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Chase Multiwall bags give your dry chemicals (effluorescent, deliquescent or anhydrous) *complete* protection—yet, they cost far less than fiber drums, metal containers, or barrels...and they save up to 75% in storage space, too. Available in any combination of plies, with or without liners, tailored to YOUR exact requirements.

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SPECIALTIES

annual sales, and Colgate shows \$424 million.† Perhaps fortunately for Pur-ex, the top three have lately paid less attention to bar soap, have concentrated on heavy-duty liquids.

Pouring It On: Lever, nursing old wounds inflicted by P&G, now has the satisfaction of watching P&G scamper to catch up with its Wisk.

P&G is going through the test-market stage, so far finds Wisk's pace a little heady. Indications are that it may have been forced to spring Biz a little faster than it would have liked to. Report has it that the company had to lick a can corrosion problem in the field, and it still has two other product problems—Biz's tendency to separate into layers on standing, and to crystallize.

Chances are these problems will soon be eliminated (if they haven't by the time you read this), but right now they are slowing P&G down. After Biz gets going, however, Lever will have to worry that P&G or Colgate

†World-wide sales.



Bottoms Up

NOT HOBBYISTS, but professional boatmen, are shown hard at work in Venice, Italy. Using the same sort of paints, caulking compounds, and antifouling paints that have made a multimillion-dollar in-

might make the first big heavy-duty liquid improvement. When it comes, this will probably be in the nature of a real gain in washing power—a quality the liquids are now deficient in.

Lower washing power is now made up for with an extra-heavy dose of optical brighteners. Wisk, for example, has 0.1% brightener (Geigey's Tinopal RBS, and American Cyanamid's Calcoflour MR), which is high, compared with Tide, which uses the same brighteners but only half as much.

Who's on Third? As in previous soap and detergent brand races, the trick is to get your brand established with a reasonable portion of the two-thirds of the market that is loyal to brands (an estimate based on a Colgate survey). One third of the country's housewives, it is believed, change brands as often as they buy soap, therefore don't offer any long-term advantage to their wooers. But when you get in with the loyal two-thirds, your competitors have an almost overwhelming task ahead.



WIDE WORLD

in Venice

dustry in the U.S. (*CW*, April 28, p. 48), these gondoliers are readying their craft for the summer tourist season. The work is carried on in the "Square," a special boatyard for the gondolas.

The man who couldn't be sold!

There was this research director in a prominent company who always insisted that you couldn't sell him anything. Prided himself on a skeptical, scientific attitude, he said.

When we started to tell him that ACINTOL® Fatty Acids contain as little as 1% rosin and no linolenic acid, have excellent color and color stability and good odor, he stuck his fingers in his ears.

So we plopped the ACINTOL Bulletin down on his bench. As we leafed through it, pointing out charts and tables giving detailed analyses of every ACINTOL Tall Oil Product and outlining profitmaking formulations, he put his hands over his eyes.

So we picked up our briefcase in despair. Then he said, "Give me a sample," and proceeded to run a series of exacting tests right before our eyes.

"You still can't sell me a thing," he finally said through the maze of glassware. "I've just sold myself. From now on, consider ACINTOL Fatty Acids standard in our formulations—and I plan immediately to look into ACINTOL Distilled Tall Oil."

Which leads us to suggest that *you* look into ACINTOL for making alkyds, esters, emulsions, fatty acid amines, preparation of non-ionics, primer surfaces for automobiles, sulfonated oils and the like. For a copy of the ACINTOL Bulletin, or a sample, please write,



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CHEMICAL COMPANY
(INCORPORATED)

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World's largest supplier of chemicals based on tall oil





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Since 1940

A record of installations

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Film of Protection for

"Thru-way Horsepower"

based on Westvaco BaO

As compression-ratios go up, lube oil additives become increasingly important for proper engine performance.

Owners' manuals now discourage the use of "Regular" and "Premium" oils . . . commend "MS", "DG" and "DS" grades containing specially-compounded oil additives. Very Heavy Duty oils will soon be specified.

Westvaco Mineral Products Division has long been the principal producer of barium chemicals on which better lube oil additives are based. In the past four years the needs of additive makers have soared 150%. Westvaco has met these needs capacity-wise, product-wise and transportation-wise. We introduced improved forms of barium alkalis—flake octa and pentahydrate. We pioneered bulk shipments. Our research and development on better barium chemicals goes forward unceasingly.

We believe that many potential uses of Barium Chemicals are yet to be fully explored. To accelerate work on new uses, we will be pleased to send you a copy of our 30-page technical manual "WESTVACO Barium Chemicals" giving essential data on our long line of barium compounds.



Westvaco Mineral Products Division FOOD MACHINERY AND CHEMICAL CORPORATION

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TURCO'S THORNBURY: A customer provided a brand-new business.



NAA'S SANZ, TURCO'S ATKINS: From a new pilot line, better techniques.

Teamed with Aircraft

When it put its second pilot plant into operation last month, Turco Products, Inc. (Los Angeles) was taking advantage of a paradoxical situation in which it, as a chemical specialties firm, has suddenly become an important factor in the metalworking business—without straying an inch from its basic field of interest.

Turco is both the prime licensee of North American Aviation's Chem Milling process and the leading sup-

plier and researcher of the chemicals used in this metal-etching process. And, while the patent (*CW*, May 26, p. 60) tells much of the technical aspects of the Chem Milling story, you have to look at Turco for the chemical and business side.

Clean Start: When formed in 1927 by S. G. (Syd) Thornbury (now president) and two associates, Turco concentrated on such products as cleaning and maintenance compounds. Floor

waxes (X-01), paint cleaners and paint strippers were added, and when it expanded into the field of metal-treating and -pickling compounds, it added plants in Chicago and Newark, N.J., Topeka, Kan., and Houston.

Since it's based in the aviation-heavy Los Angeles area, it's natural that Turco's major customers have long been the airframe manufacturers that abound there.* It was natural, too, that when research-minded North American worked out the basic principles of Chem Milling, it should turn to Turco for help on further developments. Now Turco not only licenses the process from North American, but also sub-licenses to at least 32 other firms.

The process has been improved and refined considerably since NAA's Manuel Sanz first masked an aluminum part with tape and dipped it in caustic. Aluminum is still the metal most commonly worked by Chem Milling, however, since it is the backbone of airframe fabrication.

Turco's first pilot plant and lab for the process were devoted to aluminum. Its brand-new shop, headed by Don Atkins, Jr., is for steel, magnesium and titanium research. Turco wants to give other industries a hand with Chem Milling, though right now the aircraft industry has first call on its services.

Simple, But . . . As a specialties firm, Turco has a lot better facilities to explore the various aspects of metal-etching than has an aircraft firm. And though the process is superficially simple, refinements are possible in many ways.

For work with aluminum, for example, Turco supplies five materials: an aluminum cleaner, and etching compound (based on sodium hydroxide), a deoxidizing solution (called Smut-Go, which removes the black oxidized material that forms on parts during the etching), masking material and a compound for removing the mask.

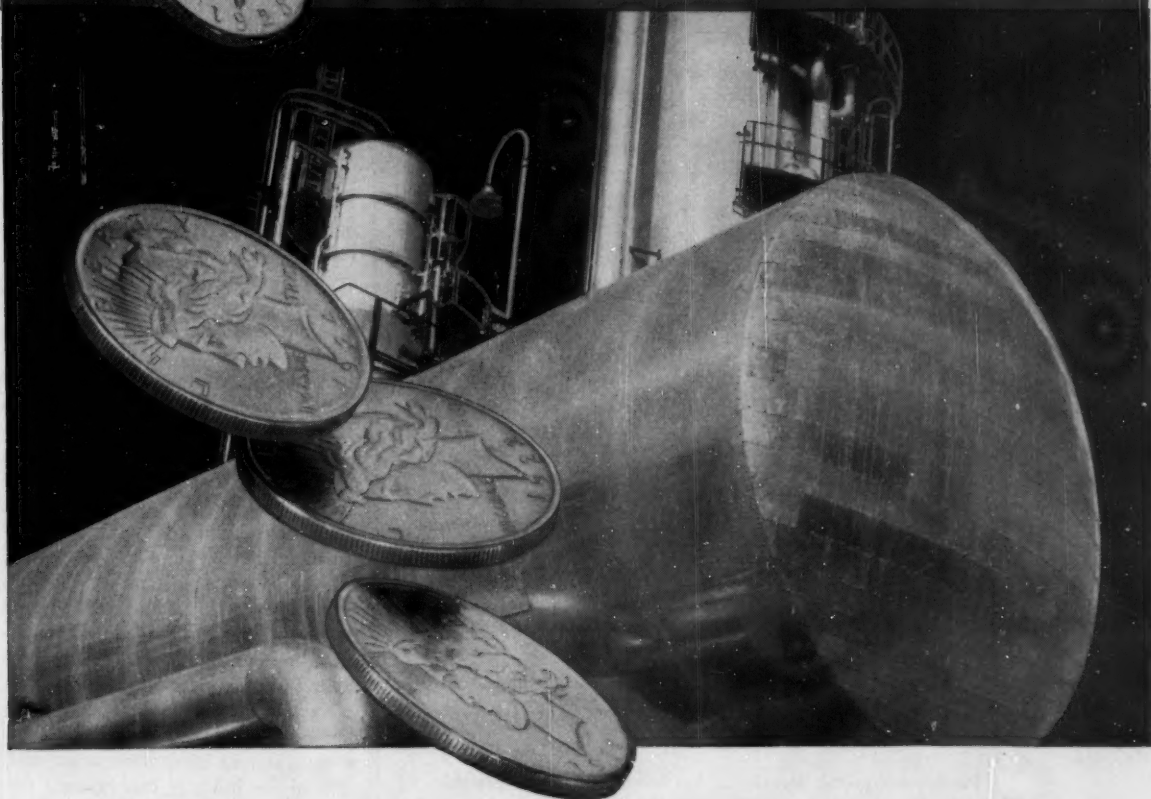
In production work, a number of problems have arisen:

- Impurities can contaminate the solution—they must be precipitated out.

- A smooth satiny finish is hard to obtain consistently.

* One of the company's many contributions to the aircraft industry has been its dy-Chek system—a dye penetrant process for detecting surface flaws in metal.

Aluminum Jacketed Process Plants...



...Stay Bright as the Dollars You Save

Aluminum resists rust and corrosion due to chemicals, gases, plant atmospheres, coastal environments. You enjoy the natural "bright-as-a-dollar" appearance of this long-lasting metal. You save the expense of painting. You save many dollars on replacement of equipment often destroyed by rust and corrosion.

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Aluminum is versatile. You get natural insulation and high heat transfer from aluminum in many plant uses. Use it for heat exchangers, high pressure steam lines, fractioning towers and many other applications.

Wherever you use aluminum, it remains bright, lasts long, and saves you money. To get more

information on aluminum in the process industries, call the Reynolds office listed under "Aluminum" in your classified telephone directory. Or write *Reynolds Metals Company, P.O. Box 1800-CM, Louisville 1, Kentucky.*

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Squeeze gently... sweet after!

Pardon our poetic license... but how well it describes this radically new package of "Pearson Sakrin." A gentle squeeze to the pliable bottle releases just the right amount of liquid sweetener for beverages and foods... hot or cold. What a boon to calorie counters or anyone who seeks sweetening in this most convenient manner.

"Sakrin" is packed in brilliantly printed BRACON squeeze-to-use polyethylene bottles of 34 and 84 cc capacities. Bottles are received at the Pearson plant with caps screwed-on, covering the unique drop forming orifice. Bottles are filled and sealed up to 180 per minute on automatic equipment made by Horix Manufacturing Co.

BRACON squeeze-to-use tubes and bottles are low in cost... thoroughly functional and strong in merchandising appeal. Consumers prefer their easy dispensing, lightness and appearance. There are BRACON squeeze-to-use packages for creams, powders and liquids ranging in capacities from 2 cc's to 32 ounces... may we tell you more? Write or phone today.



BRADLEY CONTAINER CORPORATION

Maynard, Mass. — New York, Chicago, Los Angeles, Toronto

SPECIALTIES

- The alloying materials in aluminum (copper, manganese) can cause uneven etching.

With steel and magnesium, there are additional problems: it is difficult to keep the bath at full strength, and to calculate the amount of "rejuvenating" materials to be added. With titanium, hydrogen embrittlement is difficult to avoid. Because special additives are the answers to most of these problems, Turco and its customers are close-mouthed about precise formulations used.

Tubs, Too: Turco has also investigated the various phases of equipment design—e.g., tank linings, heaters. Polyethylene and polyvinyl chloride and acetate have been investigated as linings—such material must hold up at temperatures of 160-190 F. (Hotter temperatures generally give faster milling, but firms now favor an etching rate of about 1 mil/minute—faster etching sometimes inadvertently tapers parts as they are entered and withdrawn from the tank for dimension checking. Estimates are that it costs about 50¢ to remove 1 lb. of aluminum.)

Though Chem Milling is now approaching the \$1-million/year mark in volume and is one of Turco's brightest facets, it is still only a small part of the firm's over-all sales of \$14-15 million/year. Thornbury doesn't want to give it undue emphasis, either, for he knows that it was the firm's record in metal-treating compounds and its close association with the aviation industry that brought this extra million dollars worth of business to realization.

Fountain Waxer

Floor polishing should be a less-dreaded chore for housewives using a new, low-priced (under \$2) automatic floor waxer now on the market. The product, called Wax-Wiz, is made by Pionair Products Co., Inc. (Chicago).

It has a hollow plastic handle that fills from the top and holds a full pint of any liquid wax. A no-clog valve at the bottom releases the wax smoothly, spreading it evenly on any type floor. The wax can be kept in the visible-supply handle between uses.

The wax is applied through a four-way pad, which can be turned to bring a clean surface into play. The pads are replaceable.

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Igepal CO-630 is one of a series of 8 Igepal CO brands that range from the oil-soluble Igepal CO-430 to the extremely hydrophylic Igepal CO-880. A new booklet has been prepared giving complete technical data on this important group of surfactants. Send for it today.

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(CW)

How four tough, diverse chemical packaging jobs were solved with Bemis Bags...

caustic materials

problem: Develop a shipping container with special properties to resist the corrosive action of the contents... and to cost less than the rigid containers previously used.



solution: A special multiwall paper bag, made by Bemis... a sewn valve type with a polyethylene-coated inner sheet... that cost only about one-third as much per hundredweight (including filling and closing labor) as the containers previously used. Further savings were made in storage space of both empty and filled containers and in lower shipping costs due to reduced tare weight.

powdered aluminum

problem: The product must be protected against moisture and the shipping container must also be tough enough to stand up in export shipment.



solution: Bemis Waterproof (laminated-textile) Bags, which gave the necessary moisture protection and the required durability (they're the toughest shipping bags made). Furthermore, they save the shipper a lot of money, as the bags cost about 40 cents each, as compared with \$1.25 for drums of equal capacity. There is also a substantial saving in empty container storage space.

polystyrene crystals

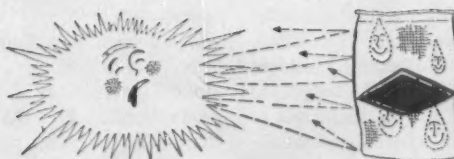
problem: Develop a shipping container that will (a) keep the polystyrene crystals entirely free from foreign matter, even down to lint particles, (b) withstand the rigors of export shipment, involving multiple handling, exposure, etc., and (c) cost less than the double-packaging (with overslips) previously used.



solution: A special type of laminated-textile valve bag developed by Bemis. The bag is constructed of tough burlap laminated between two types of special paper . . . providing ample strength, resistance to abrasion and freedom from lint. An ingenious method of sewing prevents burlap lint from getting into the polystyrene. Substantial savings are made on every bag shipped, not only on bag cost but also on labor.

resin beads

problem: Find a lower cost, easier handling shipping container for ion exchange resin beads in which the moisture content must be maintained at its original approximate 45%. The material was previously shipped in fiber drums.



solution: A Bemis Waterproof (laminated textile) Bag, with a loose poly liner. After being filled, the liner is tie-closed and the burlap bag is closed by sewing. Advantages — Necessary moisture content is retained. Shipping weight is substantially reduced. Bags are more easily handled and require less unloading time. Drum disposal problem is eliminated. There is a storage space saving of 30% on filled bags and an even greater saving in empty container storage space.

Whether your shipping container problems are similar to any of these . . . or far removed from them . . . it's likely that Bemis can help you reach a money-saving solution. Write, wire or phone us. You will soon know whether we can help you.

Bemis



General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

Consumer Formula for Consumer Favor

It's still too early for a complete evaluation, but evidence now available plainly shows that R. M. Hollingshead's (Camden, N.J.) Floor Show—polyethylene-base floor polish—is as successful as the firm hoped it would be: sales in test markets have exceeded expectations—and, fully as important, some competitive firms are swinging over to related formulations.

Floor Show hasn't yet achieved complete national distribution, although it's available in many parts of the country. But Hollingshead is pushing plans to broaden outlets as fast as it can give them the full attention it feels its product warrants. As the firm's premier effort under its own label in the household chemical field, Floor Show is getting careful treatment.

As a matter of fact, Floor Show has received special care ever since Hollingshead decided to invade the household polish field. The care began even before the trademark was chosen, before the formula had been decided upon.

Consumer's Formula: With the exception of a few products under the Whiz trademark, Hollingshead, although long a stalwart in the specialties field, had little reputation as a seller of household consumer specialties. Wilbur Norton, who became president of Hollingshead in 1952, sought to remedy this, and a floor finish was to be the product to build the reputation.

Ad Manager Tony Kupris had the job of developing the product to carry this load.

With the product type decided upon, Kupris set about finding just what the householders, who buy \$85 million worth of waxes yearly, look for in a product. In a sense, the consumer was to do the formulating.

First, the firm tried the *Chicago Tribune's* consumer panel of about 1,000 families, to check on seasonal sales, find out how welcome a new polish might be. Then Hollingshead developed a pair of formulas for polish, tested them in Philadelphia, Chicago and Minneapolis. High gloss, durability, antislip qualities, resistance to waterspotting seemed to be favored characteristics of a popular polish.

Researchers at Hollingshead thought an all-synthetic polish, based on a polyethylene resin recently made available by Allied Chemical's Somet-Solvay division, might provide these qualities. So trial formulations were made, and compared by housewives with another, standard-formula product. The still-unnamed Floor Show was overwhelmingly preferred.

A full-scale market test seemed in order, and in May '55, Floor Show was launched in Columbus, O., with heavy promotion. By the end of a month, store audits showed, the new product had 23% of the market. Other cities—Dayton and Cincinnati, O.,

San Francisco, Sacramento, and Fresno, Calif., and Philadelphia—have since been added to the test market list, and the product is doing well in all of them.

Recipe Silence: Hollingshead is understandably saying little on formulation details. It is an all-synthetic formulation, however, which indicates that the polyethylene emulsion, probably incorporating a phenol-formaldehyde leveling agent, may be fortified with a vinyl resin. Currently, Floor Show is retailing for about 90¢/pint, \$1.50/quart.

In production at the firm's new Sunnyvale, Calif., plant, as well as in the Camden, N.J., home plant, Floor Show is distributed largely through supermarket, grocery, hardware and department stores. But the industrial field hasn't been ignored—Floor Show is playing a major part in the expanded activities of the firm's industrial maintenance department.

The combination of a top quality, original, well-merchandised product has shown Hollingshead officials that the firm can definitely win a place in the households of the U.S.

\$1-Million Fly Swat

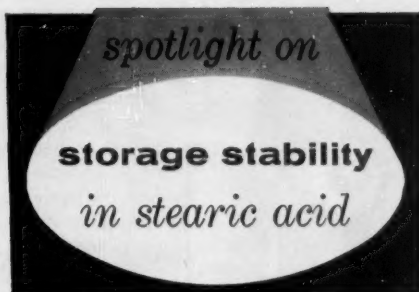
The part insecticide makers will play in Florida's hectic battle against the Mediterranean fruit fly (medfly) has now been mapped out by Congress. This month the U.S. Dept. of Agriculture will spray about \$1 million worth of malathion on infected southern Florida orchards. It is hoped that this will stop the fly, now spreading like a forest fire through five counties around Miami.

The money will come out of the \$1.5 million voted by Congress, which responded quickly to an emergency request from President Eisenhower. The state has added \$200,000 to the kitty, is expected to add more to pay for the needed chemicals, their application by airplane, and a quarantine to keep the menace from spreading.

Of the emergency federal funds, \$1.25 million are available for use before June 30. The remaining \$250,000 can't be spent before July 1, will be augmented, if necessary, by some \$600,000 in pest control contingency funds that are in USDA's fiscal year 1957 budget.



NORTON, KUPRIS: They took the kitchen door to consumer favor.



*Emersol® 132 Lily withstood 2 years
Storage with no ill-effects*



Original Color Stability: 2.3 R (5¼" cell) After Two Years: 2.5 R (5¼" cell)

Here's further proof that storage even beyond normal expectancy either on the shelf or in plant inventory, has no measurable ill effects . . . *Case History No. 2-51: A medium sized manufacturer of high-quality esters uncovered a number of bags of Emersol 132 Lily that somehow had escaped inventory rotation. Although the appearance and odor of the material was normal, he sent samples to us for assurance that it still met our high quality standards since his records indicated receipt 2 years ago. Our test results indicated that the Emersol 132 Lily was practically as good as the day it was made.*

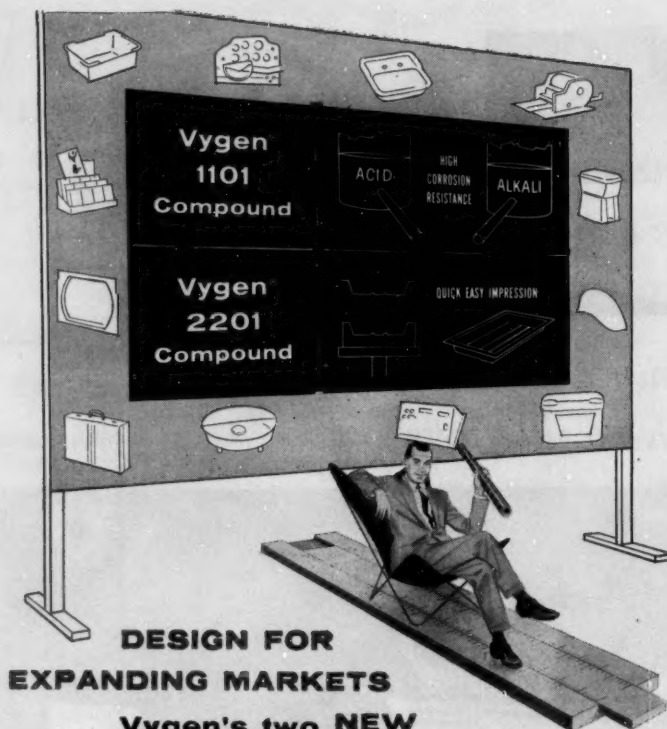
This is but one example that illustrates the superior oxidation and color stability of Emersol Stearic Acid. When this is added to their outstanding resistance to rancidity, their excellent color stability, and uniformly high quality, you have an unmatched combination that will make your products better, more appealing, and keep them that way longer. Since Emersol Stearic Acids cost no more than competitive grades, why not order enough for your next regular requirements and see such results yourself.



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Plastolein Plasticizers
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These two new Vygen rigid compounds offer easy expansion into new and better products and markets. As with Vygen-110, they are subjected to General's rigorous testing conditions and production controls. These two easy processing compounds give you ready access to the growing market potential in extruded PVC pipe and post-formed PVC products.


Product characteristics and applications

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A rigid Type I PVC compound designed specifically for extrusion. This compound comes ready for the extruder and offers the perfect balance between optimum chemical resistance and easy processing. Vygen 1101 compound can be made in a number of colors, and provides excellent dimensional stability in the finished product.

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SPECIALTIES

It is feared that the flies, if not stopped, will endanger not only a big part of Florida's \$500-million agricultural economy, but might spread to the rest of the U.S. as well. All efforts are now being made to prevent further spreading. Road blocks have been set up to turn back all fruit produced in areas known to be infested.

As many as 20,000 fly traps will be used to check the flies' spread. Meanwhile, efforts are being made to save—by fumigation—the remainder of this year's crop (over half of which had been picked when the fly was discovered).

Three Shots: The 300,000 acres now under USDA quarantine will be sprayed, with 200,000 acres getting the full treatment in June. It will cost about \$2/acre for each application of aerial spray, and the plan is to spray each acre three times during June. Bids for the job will be advertised for and processed in the USDA New Orleans regional office.

The spray solution consists of 2 lbs. of malathion dissolved in 1 gal. of water, will be used at a rate of 1 gal./acre. With a triple spraying, that means 6 lbs. of malathion for each infested acre.

Two types of attractants will be used—a hydrolyzed yeast, which lures medflies of either sex, and a newly imported and reportedly highly efficient attractant oil extracted from angelica seed, for trapping the male.

New Fields to Conquer

While U.S. firms must still keep their phenoxybutyric acid weed killers on the experimental lists, the British firm of May & Baker Ltd. (Dagenham, England) is beginning its second full season of offering its brand, Tropotox, commercially. It has also sent considerable quantities of Tropotox (also tagged MCPB, from its chemical name, 2-methyl-4-chlorophenoxybutyric acid) to the U.S. for tests.

The new weed killer, prime subject of this year's U.S. weed control conferences here (*CW*, Jan. 21, p. 72) has a number of attractive features—major one is that it is more selective than such weed killers as widely used MCPA (2-methyl-4-chlorophenoxyacetic acid).

Prof. R. L. Wain, at Wye College in England, showed that the compound, in itself, is not toxic to many



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It is this combination of skills that makes us confident PROCON can provide to the fullest measure, reliable, efficient service in the planning, engineering and construction of your refinery, petrochemical or chemical plant. We are proving this, the world around, day after day.

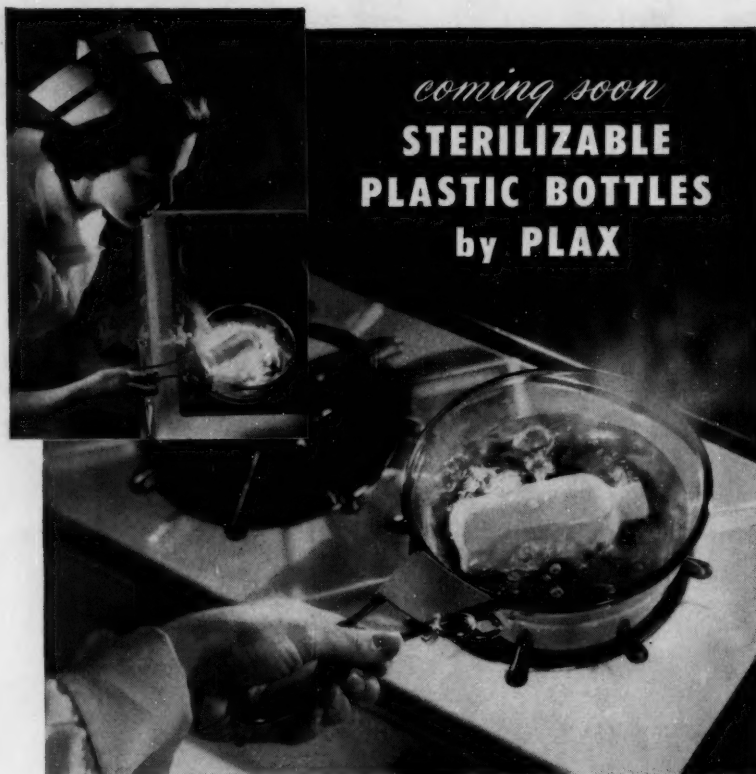
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Glo-Lite Woven Plastic Shades use light, luminous Polyflex® strips.



Acid for Gulf Oil Corporation's complete dry charged battery line is packaged in Plax disposable plastic bottles.



U. L. Accepted Plax lighting panels bring soft, diffused sunshine inside stores, offices.

Our fund of new plastics developments is constantly growing. We may have the profit-making idea you're seeking. Why not contact us and see.

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SPECIALTIES

plants, but that, in certain plants, an enzyme oxidation reaction turns MCPB into plant-toxic MCPA. Legumes such as peas and corn don't make this conversion, but weeds such as thistle do, and are self-eliminated.

May & Baker produces its Tropotox under Wain's patents, administered by National Research Development Corp. In this country, Dow and American Chemical Paint Co. produce trial quantities.

Round Two: The Burtonite Co. (Nutley, N.J.) offers paper makers its Burtonite No. 7 as an alternative to synthetic wet-strength resins. A derivative of guar seeds, the product is mixed with borated water, to make wet-strength paper. No studies have been made to determine whether it is likely to irritate the skin (*CW*, April 28, p. 52).

It Adds Up: A rundown of 550 chemical additives for foods, and their usage levels, is contained in a special report issued by the National Academy of Sciences and National Research Council. The report is available (\$2) from the Publication Office, NAS-NRC, 2101 Constitution Ave., Washington 25, D.C.

Next to the Skin: The toxicity of several chemical agents that could be used to mildewproof clothing is evaluated in PB 111800, a report on tests made by Industrial Toxicology Laboratory, Wright Air Development Center. A number of chemicals are rated for primary irritant effect to the skin and degree of sensitivity. The publication is available (75¢) from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.

88% of California: A recent evaluation of the market potential for electrolyte soil conditioners shows that only 12 million acres of California's 100 million acres are used as crop land. Of the rest, 70 million are forests, mountains and desert, 18 million are brush land. Of the total 6-state Far West area's 453 million acres, only 28 million are crop land. Although the soil conditioners could make much of the remainder usable for crops, high price has prevented their use. An estimate was made of the cost the market could bear: if the money return was increased 10% on



he used to be a waiter

Always waiting for plaster to cure. He doesn't have to any more. Polyvinyl acetate primers formulated with GELVA emulsions licked this problem. He's a full-time painter again. Because GELVA emulsion primers transmit moisture vapor and resist alkali attack they can be used over green plaster.

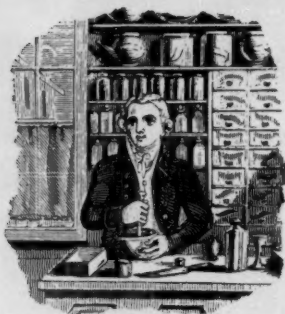
Shawinigan has successfully formulated GELVA emul-

sions for polyvinyl acetate paints since 1944. This unequalled experience combined with continuing research makes Shawinigan a name to remember in today's paint market. For full information write Shawinigan Resins Corporation, Department 1123 Springfield 1, Mass.

GELVA® emulsions for paints



Routing the *Raillietina cesticillus*... with Tin Chemicals



In 1803 Dr. John Ford of London noted that when granulated tin was used as a purge for worms in humans, it also functioned as an excellent sedative. As such he prescribed it in several cases of hypertension. Tin remained Dr. Ford's special sedative for years and England's standard worm remedy for nearly a century.



TODAY a compound of tin is doing a remarkable job as an anti-wormant in veterinary medicine. A few years ago Dr. Salsbury's Laboratories, pioneers in poultry pharmaceuticals, were looking for a chemical that would be non-toxic for poultry, but effective against the deadly poultry tapeworm, *Raillietina cesticillus*. For experimental purposes hundreds of compounds of tin were supplied by Metal & Thermit. M & T Dibutyltin Dilaurate is now contained in two patented formulations of Dr. Salsbury's "Wormal," one of the most effective poultry tapewormers ever developed.

THE VERSATILITY OF TIN CHEMICALS is by no means limited to medicine. In any field—automotive, aviation, textile, food, plastics—if you're looking for ways to lower costs or improve techniques, it will pay you to get in touch with us—

TIN & TIN CHEMICALS
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SPECIALTIES

a high-yield crop (\$500/acre), a price of \$400/ton would be economically feasible; at the other extreme, if return was increased 5% on a low-yield crop (\$30/acre), the price would have to be \$12/ton. Present prices for 100% active materials are \$2,600 to \$3,000/ton. The report is available from the Industrial Dept. of the San Francisco Chamber of Commerce.

To Gather More Data: The Food & Drug Administration hearing on over-the-counter cortisone ointments (*CW*, April 14, p. 48) slated for May 28 has been rescheduled to Aug. 15. The delay, to allow more time to gather data for the hearing, was requested by firms on both sides of the question—Merck (Sharp & Dohme Division) and Upjohn, who favor non-prescription sales, and the American Dermatological Assn. and the Retail Pharmacy Trade, opposing it.

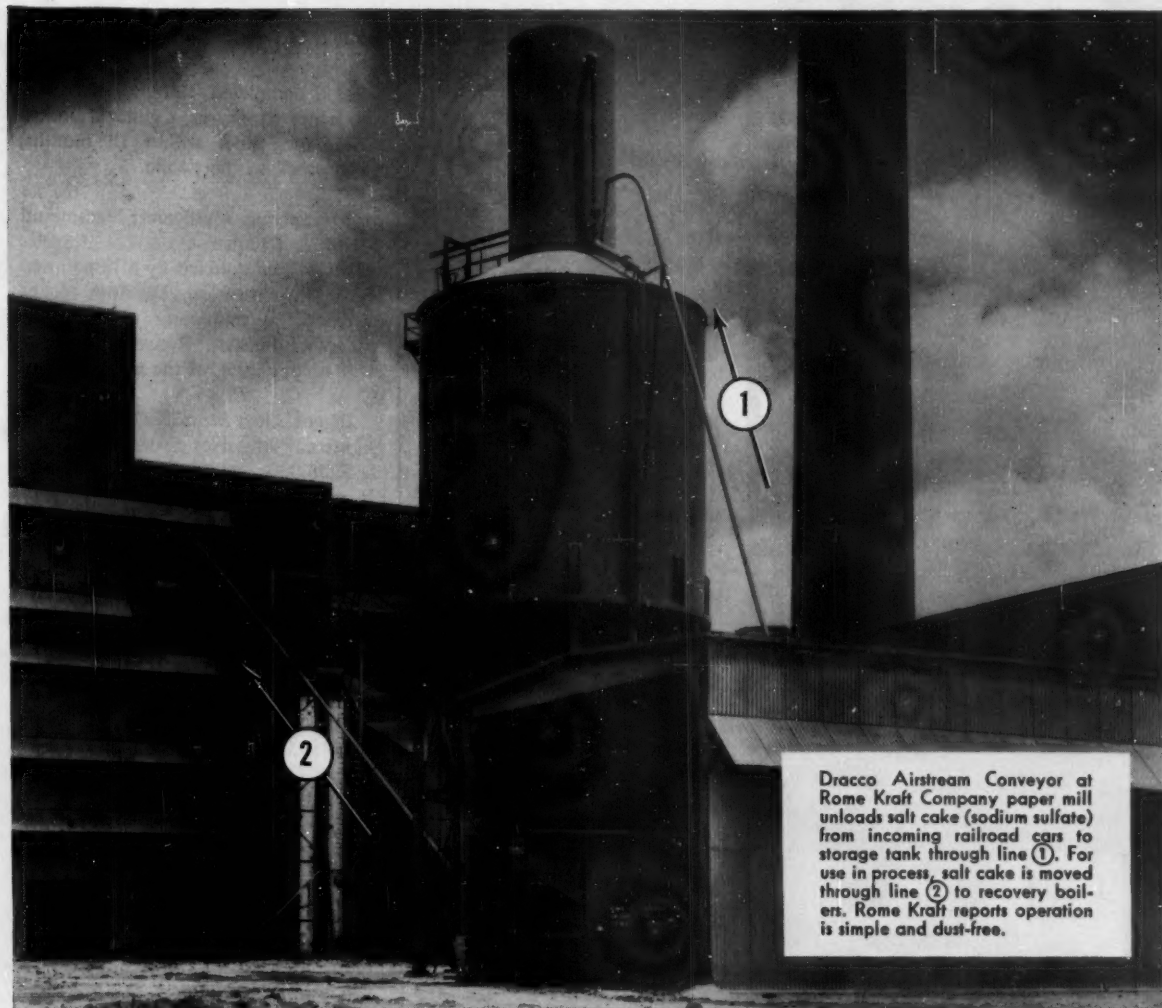
Keep Away: As the result of field tests conducted for the Army, the U.S. Dept. of Agriculture has issued a report evaluating possible mosquito repellents. Twenty-one were found to give longer protection than the standard products (dimethyl phthalate, ethyl hexanediol, Indalone, and a 6-2-2 mixture of the three); five gave 1½-2½ times the protection. Of these five, however, only one—the propyl ester of N,N-diethylsuccinamic acid—has been cleared in pharmacological tests for use on the skin.

EXPANSION

Flying Carpet: The National Institute of Rug Cleaning has moved from Silver Spring, Md., to larger quarters in Bethesda, Md.

Industrial Scents: Alpine Aromatics, Inc. has been formed in Metuchen, N.J., by Raoul Pantaleoni. The firm specializes in industrial odorants.

Unhooking Hooker: Detrex Corp. (Detroit), which three years ago joined with Hooker Electrochemical Co. (Niagara Falls, N.Y.) to operate a large trichlorethylene and anhydrous-hydrogen chloride plant at Ashtabula, O., is now negotiating to take over the entire plant. A fast-growing supplier of dry-cleaning chemicals, Detrex has just obtained \$4.5 million to expand the Ashtabula plant. When the



Dracco Airstream Conveyor at Rome Kraft Company paper mill unloads salt cake (sodium sulfate) from incoming railroad cars to storage tank through line ①. For use in process, salt cake is moved through line ② to recovery boilers. Rome Kraft reports operation is simple and dust-free.

one Airstream Conveyor does two handling jobs

The Dracco Airstream Conveyor recently installed by the Rome Kraft Company, Rome, Georgia, performs two separate handling functions. First, salt cake is unloaded from railroad cars to storage; later, when required, it is conveyed from storage to process. Both operations are economically handled by one conveyor—with materials moved by air at 10 tons per hour.

This versatile, low-cost handling is typical of Dracco Airstream Conveyors—the modern method for moving all types of dry, bulk granular, or powdered

materials. Air conveying of chemicals, foods, plastics, grains and hundreds of other materials is fast and safe. There is no costly manual handling and one-man supervision is normal. Buying materials in bulk provides added savings.

Dracco Airstream Conveyors can load and unload, distribute to process, transport between plants, and weigh, blend and batch automatically en route. There is no dust, no material loss from spillage or broken bags, no spoilage from moisture and contamination. Their self-cleaning feature permits sanitary handling of

foods, allows quick switchover to other materials without intermixing. Systems require minimum space, can be installed in any new or existing plant.

In all these ways, air moves materials better. And *no one moves air better than Dracco*. On your next bulk handling problem, call in Dracco for a cost-saving solution. Write for literature today.

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FREE! THE DRACCO ENGINEER. Describes Dracco solutions to many bulk materials handling and dust control problems—includes tips on improving plant efficiency... published quarterly. Get on the mailing list. Write on your letterhead today!

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SPECIALTIES

deal is completed, Detrex will change its name to Detrex Chemical Industries, Inc., and, within 18 months, offer stock to the public.

Multiplying Multicolor: Paramount Paint & Lacquer Co.'s Los Angeles plant will be doubled by a just-started \$200,000 expansion. The firm makes Zolatone, a multicolor coating, and 70 other finishes. Research facilities will occupy 20% of the new addition.

Bigger Stick: Stein, Hall & Co., Inc., industrial adhesives maker, will build a \$250,000 plant in Charlotte, N.C. It will be a 30,000-sq.-ft., one-story building on an 8-acre site. Textile resins and liquid adhesives will be made at the new plant, which will also house a laboratory and office. Construction is expected to be completed by the end of the year.

Economic Move: Economics Laboratory, Inc. (Minneapolis) is building a \$750,000, 85,000-sq.-ft. Chicago plant. The cleaning compound firm will give up its present quarters when the new ones are completed early next year.

More Floor Space: General Tire & Rubber Co.'s floor covering production facilities will be doubled by the addition of space and equipment to turn out Terrazzo, General's just-announced vinyl tile (companion to Bolta-Floor).

PRODUCTS

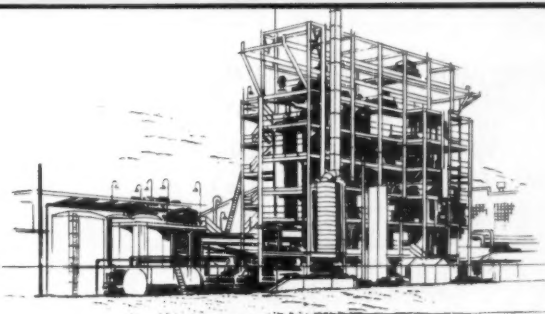
Glove of Salve: Silconex (77% silicone) is a new protective ointment for use on the skin. Made by Hygiene Research, Inc. (New York), it is said to resist both water-dissolved material and organic solvents, and to have the highest percentage of silicone of any available ointment.

Spotty Sales: A new speckled aluminum paint, which can be brushed, sprayed, or rolled on, has been developed by Reynolds Metals Co. (Louisville, Ky.).

Rust Away: A new chrome cleaner made by Rooto Corp. (Detroit) is claimed to make removal of rust and grease from auto bumpers, copper utensils, chrome plumbing a matter of sponging it off.

organic chemicals

FROM ROHM & HAAS COMPANY



Acrylic monomers

ACRYLIC ESTERS—A wide range of monomeric acrylate and methacrylate esters is available, providing a series of monomers whose polymers vary from very soft, rubber-like, film-forming materials to hard, transparent plastics. These esters may be polymerized by a variety of processes—bulk, suspension, solvent, and emulsion. They copolymerize readily with a large number of other monomers, permitting considerable modification in the physical properties of the resulting copolymers. *Typical uses:* Polymers and copolymers of monomeric acrylic esters are useful as thermoplastic sheets and molding powders, solvent coatings, binders for explosives, heat-resistant elastomers, adhesives, water-soluble thickeners, and emulsions for the textile, leather, paper, and paint fields. They are also used as intermediates for pharmaceuticals, photographic chemicals, and detergents.

ACRYLIC ACIDS—Both glacial acrylic and glacial methacrylic acid are available. These water-soluble acids may be polymerized to water-

soluble polymers, or they may be copolymerized with other monomers to obtain polymers having varying degrees of solubility in alkali or water.

Typical uses: The use of small quantities of these acrylic acids in copolymers can: 1) provide a product which can be vulcanized with metallic oxides without use of sulfur, or can be cross-linked with diepoxides, diamines, glycols, etc., 2) increase the mechanical stability of emulsions, 3) improve adhesion, 4) increase resistance to attack by oils. Amphoteric copolymers may be produced by copolymerization with basic monomers such as vinyl pyridine. The acids also serve as intermediates for the production of special esters such as glycol diacrylate and dimethacrylates.

OTHER MONOMERS—*Calcium acrylate* is a water-soluble monomer which may be used for soil stabilization. *Methacrylamide* is another water-soluble monomer, which can be polymerized to a water-soluble polyamide, or copolymerized to give a reactive group for cross-linking purposes.

The following acrylic monomers are available:

Commercial Quantities : Methyl acrylate • Ethyl acrylate • Butyl acrylate • 2-Ethylhexyl acrylate • Methyl methacrylate • Ethyl methacrylate • Butyl methacrylate • Hexyl methacrylate • Decyl-octyl methacrylate • Lauryl methacrylate • Stearyl methacrylate • Glacial methacrylic acid

Pilot Plant Quantities : Octyl acrylate • Methoxyethyl acrylate • Glacial acrylic acid • Calcium acrylate • Methacrylamide



Chemicals for Industry

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Representatives in principal foreign countries

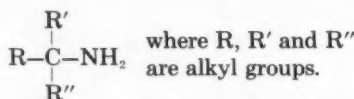
Methylamines

Rohm & Haas methylamines, monomethylamine: CH_3NH_2 , dimethylamine: $(\text{CH}_3)_2\text{NH}$, and trimethylamine: $(\text{CH}_3)_3\text{N}$ are very low-cost sources of basic organic nitrogen. All three amines are available in either aqueous or anhydrous form. *Typical uses:* The dimethyldithiocarbamates and tetramethylthiuram sulfides have shown usefulness as agricultural fungicides, accelerators for rubber vulcanization, and animal and insect repellents. Surface active agents are available by several synthetic routes starting with monomethylamine. Monomethylamine also is used in the preparation of p-methylaminophenol, the sodium salt of which is utilized in photographic developers. 1,3-Dimethylurea, produced from monomethylamine,

is an intermediate in the synthesis of theophylline and caffeine. Monomethylamine is a raw material for a number of sympathomimetic drugs (e.g., N-methyl-phenethylamine or N-methyl-phenylpropylamine derivatives) and analgesics not related to or derived from morphine. Dimethylaminoethanol, an intermediate for local anesthetics and antihistamines, is prepared from dimethylamine. The preparation of choline chloride, widely used poultry feed additive, employs trimethylamine. Other uses for the methylamines include the production of high molecular weight quaternary ammonium salts, acidic-gas absorbents, and explosives. Commercially available.

Primene alkyl amines

The Primene® alkyl amines, Primene JM-T and Primene 81-R, primary amines, are free-flowing liquids having the general formula:

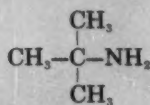


Primene JM-T contains 18 to 24 carbon atoms; Primene 81-R, 12 to 15 carbon atoms. These products undergo most of the reactions typical of

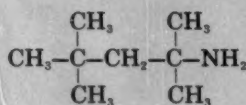
straight-chain primary amines. In some cases, however, their reactivity is unusual. They react, for example, with formaldehyde to yield relatively stable, monomeric azomethines ($\text{RN}=\text{CH}_2$). *Typical uses:* The excellent oil solubility, color stability, resistance to oxidation and fluidity of the Primene amines are advantageous in oil additives. Other suggested applications for derivatives include bactericides, fungicides, corrosion inhibitors, anti-oxidants, textile chemicals, and pharmaceutical products. Commercially available.

t-Alkyl amines

These amines, t-butylamine and t-octylamine, are light-colored liquids having the structural formulae:



t-Butylamine



t-Octylamine

Tertiary-butylamine boils at 44° to 50° C., tertiary-octylamine at 137° to 143° C. These amines undergo most of the reactions common to the

primary amines, with some few exceptions. When reacted with aldehydes, for example, t-butylamine and t-octylamine yield relatively stable, monomeric aldimines ($\text{R}-\text{N}=\text{CHR}'$); with cyanogen chloride, stable monomeric cyanamides ($\text{R}-\text{NH}-\text{CN}$). The t-alkyl primary amines can be alkylated and alkoxylated to produce secondary amines, with the formation of very little tertiary amine. *Typical uses:* intermediates for rubber chemicals, insecticides, bactericides, oil additives, photographic chemicals, pharmaceuticals, surface active agents, corrosion inhibitors, and dyestuffs. Commercially available.

Priminox polyethoxy amines

These amines have the general formula:



where n is the number of ethoxy groups and R represents a tertiary-alkyl group of 18 to 24 total carbon atoms. They are obtained by reaction of Primene JM-T with ethylene oxide. Priminox® 43, a liquid at room temperature, has one ethoxy group. It is soluble in aromatic hydrocarbons and common organic solvents. Priminox 10, also a

liquid at room temperature, has 5 ethoxy groups. It is slightly soluble in oil and water. Priminox 21 has 15 ethoxy groups, is a paste at normal temperatures, and is soluble in water and aqueous acids. Priminox 32 has 25 ethoxy groups, is a solid at normal temperatures, and is soluble in water and aqueous acids. The Priminox amines effectively reduce surface and interfacial tension over a wide pH range, and are useful in low-foaming, efficient detergents. They are also suggested for use as bactericides, corrosion inhibitors, and fuel oil additives. Commercially available.

Dytol fatty alcohols

The Dytol® fatty alcohols are long-chain compounds having the general formula $CH_3(CH_2)_nOH$. Typical alcohol compositions of the various Dytol alcohols are given in the accompanying table.

The Dytol alcohols undergo many of the chemical reactions typical of alcohols. They may be ethoxylated, sulfated, esterified, halogenated, and dehydrated. They may be oxidized to aldehydes and carboxylic acids. *Typical uses:* As intermediates, the Dytol alcohols are useful in additives for cosmetics, polymerization regulators for

rubber, textile finishing and softening agents, pharmaceutical quaternary ammonium compounds, and emulsifiers and detergents. Commercially available.

	Dytol A-24	Dytol B-35	Dytol E-46	Dytol J-68
% Decyl (C_{10})	1.5	1.5	none	1.0
% Lauryl (C_{12})	71.0	60.0	none	80.0
% Myristyl (C_{14})	27.0	25.0	1.2	19.0
% Cetyl (C_{16})	0.5	13.0	34.0	none
% Stearyl (C_{18})	none	0.5	64.8	none

Alkylphenols

Octylphenol, a light-colored, flaked solid and nonylphenol, a pale amber liquid, have these formulae:



Octylphenol



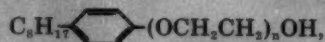
Nonylphenol

Both alkylphenols are insoluble in water, but soluble in many common organic solvents. They undergo most of the reactions common to phenols; namely, nuclear substitution, esterification, etherification, and salt formation. *Typical uses:* Reaction with alkylene oxides yields non-ionic surface active agents, the solubility of which vary with the number of alkoxy groups. The alkyl-

phenols may be reacted with aldehydes to produce phenolic resins; used in small quantities with other phenols in the preparation of phenolic resins, the alkylphenols serve to improve water resistance, oil solubility, and electrical properties. They also act as internal plasticizers. The reaction of alkylphenols with formaldehyde or with sulfur halides yields intermediates for lubricating oil antioxidants and detergents. Other products available through octyl- and nonylphenol include fungicides, germicides, rubber chemicals, pharmaceuticals, adhesives, and corrosion inhibitors. Octylphenol, in addition, stabilizes ethyl cellulose against deterioration by heat and light. Commercially available.

Triton surface-active agents ... the nonionic octylphenoxyethanol series

Nine surface-active agents, reaction products of ethylene oxide with octylphenol, are available. They have the following general formula:



and may be arranged in order of increasing number of ethoxy groups:

Name	n	Name	n
OPE-1	1	Triton X-102	12-13
OPE-3	3	OPE-16	16
Triton X-45	5	OPE-20	20
Triton X-114	7-8	OPE-30	30
Triton X-100	9-10		

The solubility in water of these surface-active

agents varies from relative insolubility (OPE-1 through Triton® X-45) to excellent solubility (higher members) over a wide temperature range in hard water and brine. The products designated OPE-1 through Triton X-102 are somewhat viscous, light-colored, 100 percent active liquids. OPE-16, OPE-20, and OPE-30 are waxy solids at room temperature, and to facilitate handling are supplied as 70 percent aqueous solutions. All of the materials are stable in acid and mild alkali and do not interact with cationic or anionic surface-active agents.

The OPE series of surface active agents are useful as wetting agents, emulsifiers, detergents, and wherever reduction of surface tension or interfacial tension is desired. Selection of the appropriate agent for any application, naturally, depends upon the characteristics of the system. In general, the diversity of the series should make it possible to select one or more products which will fulfill almost any need for a surface-active agent. Commercially available.

Other Rohm & Haas Products

ACRYLOID® oil additives

AMBERLITE® ion exchange resins

AMBERLITE ion permeable membranes

DITHANE® fungicide

PARAPLEX® and MONOPLEX® plasticizers

PARAPLEX polyester laminating, casting, and molding resins

PLEXIGLAS® acrylic plastic sheet and molding powder

RHOPLEX® acrylic emulsions for coatings and textile finishes

TRITON® surface active agents

Coatings resins

Disinfectants and sanitizers

Industrial enzymes

Insecticides

Larvacides and miticides

Leather chemicals

Paper chemicals

Plywood adhesives

Rubber chemicals

Textile chemicals

Thickening agents



Chemicals for Industry

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WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

THE SHORTAGE OF SCIENTISTS AND ENGINEERS: Are We Losing the Race with Russia?

THERE is new confidence in the Kremlin. One key reason is expressed in a recent boast of Communist Party Secretary Khrushchev: "The capitalists always regard our people as being backward, but today we have more engineers and more supporting engineering technical personnel than any capitalist country." He promised that this lead would be widened and that communism would be victorious without war.

This boast cannot be dismissed as communist propaganda. Admiral Lewis L. Strauss, chairman of the U. S. Atomic Energy Commission, has warned: "In five years our lead in the training of scientists and engineers may be wiped out, and in ten years we could be hopelessly outstripped. Unless immediate steps are taken to correct it, a situation,

already dangerous, within less than a decade could become disastrous."

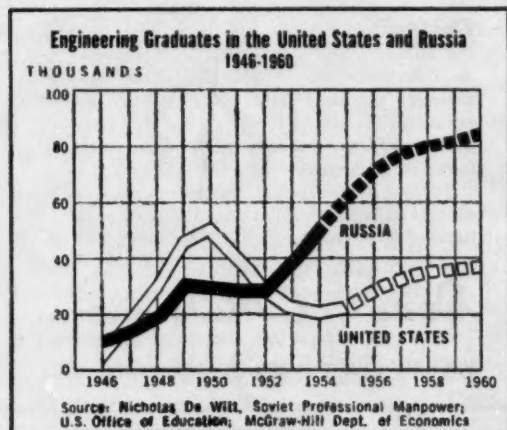
This second editorial in a series on the shortage of scientists and engineers is designed to explore as carefully as possible the facts and the implications of the new emphasis on technical training in the Soviet Union. It draws heavily from the authoritative book *Soviet Professional Manpower*, prepared for the National Academy of Sciences and the National Research Council by Nicholas DeWitt of the Russian Research Center of Harvard and released recently by the National Science Foundation.

Trend Is Against Us

If the Soviet Union already has a lead in technical manpower, it is not very great. Both the United States and Russia now have around a million scientists and engineers. About a third of the Russian engineers were trained on inferior pre-1935 standards. **It's the trend — shown in the chart — that is alarming.**

Over the last five years we have turned out only 142,000 engineers, compared to an estimated 216,000 in Russia. In 1955 our output was around 23,000 compared to their 63,000. Over the next five years our projected output is 153,000, against at least 400,000 in Russia. There will be an additional 150,000 or more in the satellites and Red China.

In Russia, 30% of the college students are in engineering, compared to 8% here. Another 30% or more take degrees in natural sciences. Moreover, unlike ourselves, the Russians are



ploughing back a large proportion of their science graduates into teaching, which implies a rapid buildup in the future.

Quality As Well As Quantity

It would be foolhardy to assume that these new Russian graduates are inferior to ours in the quality of their technical training. They start out with much more intensive mathematical and scientific preparation at the high school level. They study harder and longer in college, with more laboratory work and more practical training. Their courses and textbooks seem to be as thorough as ours. Even though the Russian graduates may be overspecialized, they get results.

These results have been striking. The Russians developed both A-bombs and H-bombs faster than we expected, and it's not certain that they had to rely much on espionage. They pushed ahead of us for a while in jet fighter design, and they showed up with a fleet of long-range bombers well ahead of schedule. They are crowding us on nuclear power, electronics and automation. There are grave fears that they have established a lead in the vital field of military rockets.

The goal of Soviet scientific manpower policy includes not only weapon supremacy but also leadership of the neutral and uncommitted areas of Asia, Africa and the Middle East. The Soviet leaders may be bluffing in their offers to export capital, but they are preparing to export Russian scientific and technical know-how in a big way.

How They Do It

The Russians are determined to win the race for scientific supremacy, and they do not count the cost. **They pay their scientists and engineers salaries that seem fantastic when compared with other Soviet incomes.**

Senior professors, research scientists and top engineers are a major segment of the Russian elite. Their incomes are frequently six to ten times the average industrial wage. (In the U. S. six to ten times the average industrial wage would be \$25,000 to \$40,000 a year.) Housing and other privileges are correspondingly lavish. While preaching equality, the Soviets use capi-

talistic incentives far more boldly than we do. Indeed, practicing engineers and scientists have been complaining about the exalted status of professors and top research people, and salary scales are now being adjusted to give greater emphasis to practical results.

The Russians are also generous in their aids to education. Tuition has just been made free at all levels. Undergraduates receive 200 to 500 rubles a month and graduate students 800 rubles (about equal to an industrial wage) to cover living expenses. The biggest stipends go to science and engineering students. College students are deferred from military service, and engineers and scientists often enjoy continued deferment even after graduation.

Finally, the Soviet leaders can channel engineers and scientists — and all other human and material resources — into any area they choose. And the areas the Soviet leaders choose are predominantly those that contribute to military or political objectives, rather than to a better life for consumers.

What's Our Answer?

We are certainly not going to adopt Soviet methods. We do not want scientific robots, but free men, able to understand and add to our democratic heritage. At the same time, our world leadership in technology — and perhaps even our survival as a nation — will be threatened if we allow ourselves to lag far behind Russia in the training of scientists and engineers. Ways to keep the United States in the race will be discussed in a later editorial in this series.

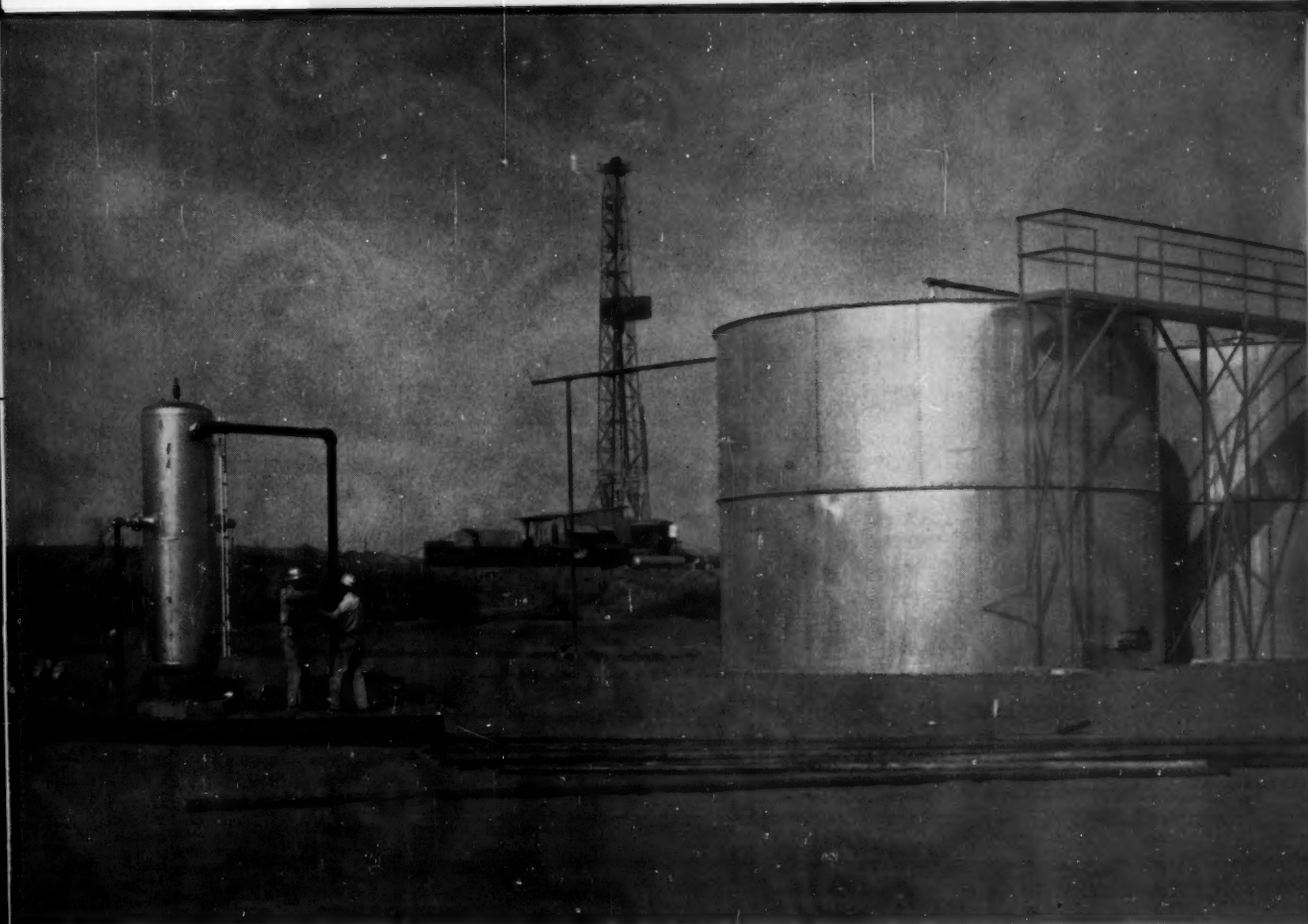
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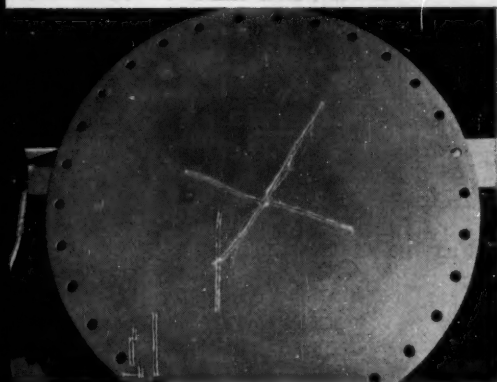
Donald C. McGraw

PRESIDENT

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Coating "still like new" after 8 years of sour crude oil service!



This is a hatch from one of the tanks in this test. The coating was 100% intact, the cross being deliberately cut to show the clean, perfect condition of the steel underneath. Data courtesy of **Plastic Coating Corporation**, Houston, Texas.

Protection of these oil tanks for sour crude service is a tough job. Corrosive conditions are always present. Yet, where coatings based on BAKELITE Brand Vinyl Resins are used, they are in excellent condition where others failed in 18 months to 2 years. No other type of protective coatings matched this record of 8 years.

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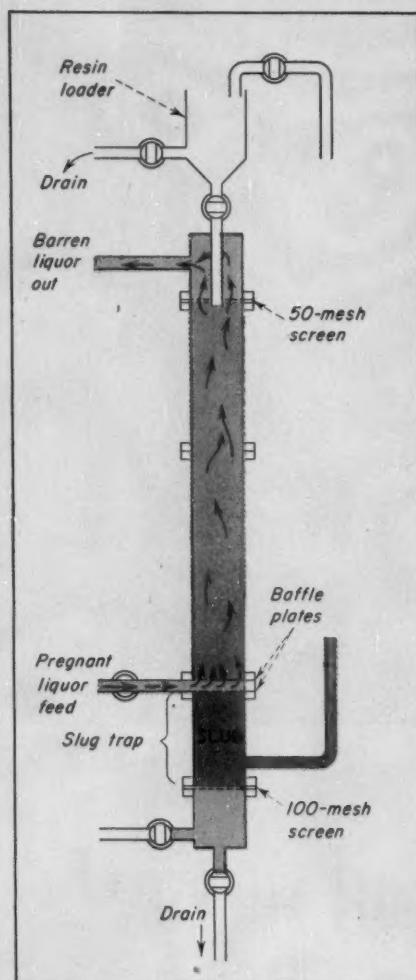
*Vinyl, Phenolic, Epoxy,
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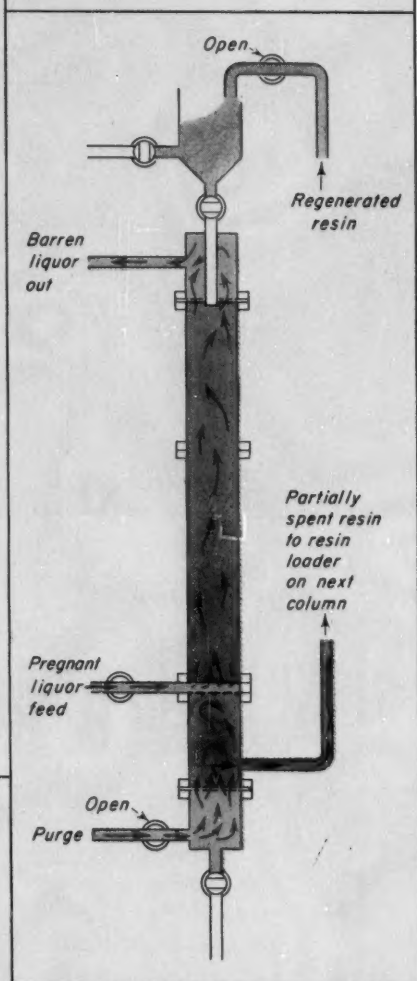
BAKELITE COMPANY, A Division of Union Carbide and Carbon Corporation **UCC** 30 East 42nd Street, New York 17, N. Y.

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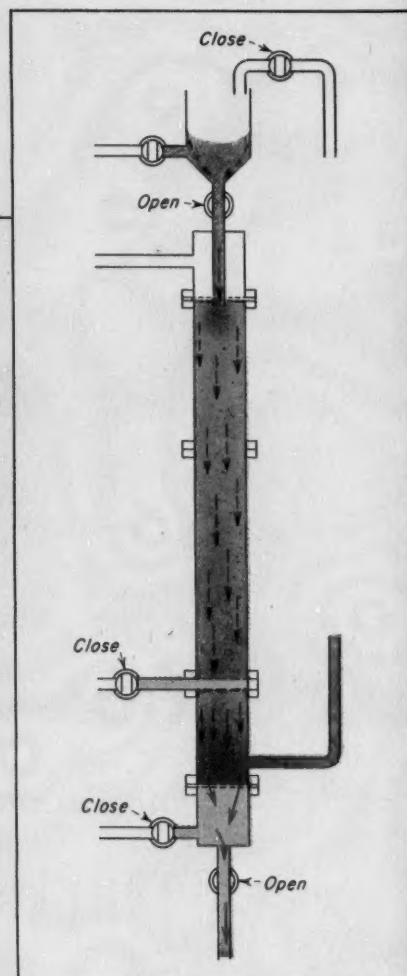
PRODUCTION



1 Column onstream, ready for removal of partially spent resin slug.



2 Partially spent slug is purged, loader fills with regenerated material.



3 Fresh resin from loader enters top of column; spent resin from bottom enters trap.

New Try for Continuous Ion

WITH THE GROWING number of ion-exchange uses—e.g., uranium recovery, ion-exclusion processes—chemical processors' incentive to find a continuous ion-exchange process is greater than ever before. And now a new system is claiming their attention, a slug-purging column, developed by metallurgist Robert Porter and piloted by Peterson Filters & Engineering Co. (Salt Lake City, Utah).

Though not yet proved in a commercial-scale operation (Du Pont is believed to be readying the first one), Porter's unit is exciting a flurry of interest among ion-exchange experts. Dow Chemical, which holds a patent on a similar system, is reported to be considering it for a specific use; several others are closely watching its progress.

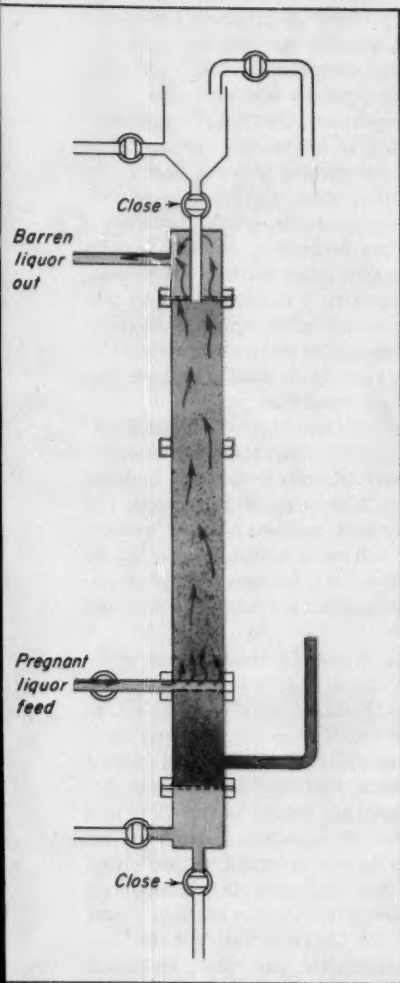
Old Idea: Actually, the principle of moving a slug-at-a-time of ion-exchange resin countercurrent to a liquid feed did not originate with Porter. In fact, pulsed resin flow has been the method employed by most of the continuous systems that hold promise of commercial success. What's different about Porter's unit is the way in which the resin is purged from the column.

The resin transfer cycle of the new

system (*left and below*) begins with the opening of a purge valve to admit pregnant liquor to a slug trap at the bottom of the column. A slug of spent resin, held between a baffle plate at the liquor feed inlet and a bottom screen, is swept out by the liquor, flows to the resin loader of the next column in the system. Resin above the trap is held in the upper part of the column by baffle-directed upward flow of incoming liquor. Simultaneous with the removal of spent resin at the bottom of the column, regenerated resin is introduced to the resin loader at the top.

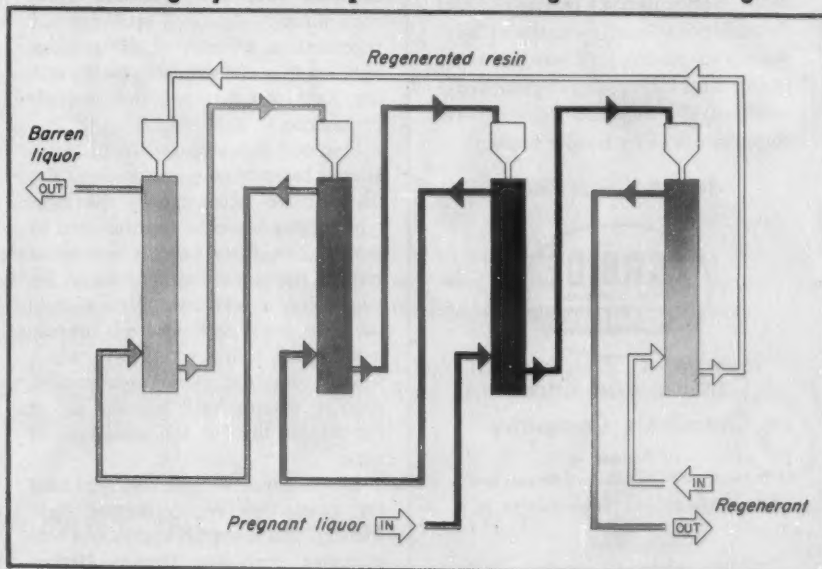
After the slug has been removed, the liquid feed is cut off briefly to permit the next slug to enter the trap while fresh resin comes in at the top of the column. Liquor displaced from the trap passes out through a bottom drain. Cycle is completed by closing drain and resin feed valves, restarting pregnant liquor flow.

Some Answers, Some Problems: Though the merits of the slug transfer system will undoubtedly vary with different applications, it does appear to be the answer to some of the problems common to all continuous ion-exchange operations. Attrition of the resin, for example, may still be something of a problem, but it should cer-



4 Column back in normal operation (as in No. 1) ready for next slug-removal cycle.

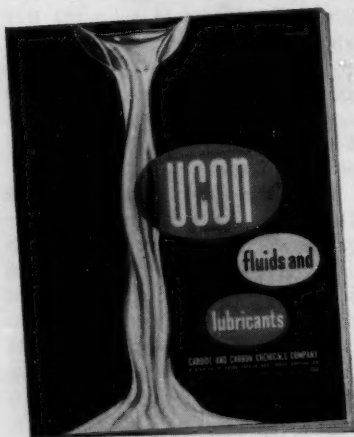
Porter's slug system adapts to multistage ion exchange



Exchange

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booklet...*



... that will show you how UCON synthetic fluids and lubricants can make a difference in your equipment performance, processes, and formulations—and, more than likely, save you money? (Their uses are many and diverse, ranging from mechanical lubricants to cosmetic components to hydraulic fluids.)

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PRODUCTION

tainly be less so with the liquor purge than it would be in a mechanical transfer system.

On the other hand, the liquor used for purging adds to the problem of carryover to the regeneration column. However, this effect can be overcome, where required, by using additional columns to wash the resin before and after regeneration.

In columns using solution upflow, an important consideration is the limiting effect of resin loss on the volume of liquor that can be put through the column. If solution flow rate is too high, resin is fluidized and carried out with the barren liquor. Porter uses a screen above the resin column to minimize this loss, reports that water of zero hardness can be produced at flow rates as high as 25 gal./minute/sq. ft. of column cross section.

Competition Aplenty: In view of the chemical industry's preference for continuous processes and its current emphasis on ion exchange, the slug system won't lack for competition. Prospective users are waiting to be shown just how effective it is; and, in the meantime, they're not counting out any of the other potentially workable systems.

One that's very much in the picture at present is an hydraulically pulsed column developed by I. R. Higgins and co-workers at Oak Ridge National Laboratories. Higgins reverses conventional column operation, passes solution downward through the resin. Movement is provided by hydraulic impulses that simultaneously force resin through separated exchange and regeneration sections of the column. Solution flow is interrupted briefly during resin transfer, but is essentially continuous.

Stanford Research Institute's Nevin Hiester has worked out a rotating valve that achieves mechanically the same type of slug-at-a-time transfer used by Porter. The valve isolates a plug of resin at the bottom of the column, retains it on a perforated glass disk in the valve bore. As the bore is rotated, it is aligned with a water inlet, which washes resin out. After regeneration, resin is metered back into the top of the column through the same type of valve.

Ejection systems have also been used for continuous countercurrent resin transfer. The first truly continuous ion-exchange unit—the Dorco Hydro-

Softener—utilized ejectors for moving water-softening resins through two fluidized beds and a separate brine regenerating cell.

A completely different approach to the problem is Permutit Co.'s (New York) rotary countercurrent ion-exchange unit. A radical departure from conventional types of ion-exchange equipment, this unit operates like a rotary kiln with pregnant liquor and resin entering at opposite ends and passing countercurrent through a series of vertically separated cells.

In operation, the level of liquor-resin mixture is maintained slightly below a central opening between sections. As the unit rotates, the resin is picked up by a screen baffle, which discharges it into the succeeding section. A solid baffle then raises the level of the solution, causing it to flow by gravity into the next cell in the opposite direction. Screens can be designed to transfer all or any part of the resin in the cells during each revolution.

Permutit has built and operated a 3-ft.-diameter, 3-cell test unit, visualizes commercial units up to 10 ft. in diameter with as many as 16 sections. The rotary unit, says Permutit, is particularly well suited to handling slurries (in uranium and hydrometallurgical applications) that are difficult to filter and clarify.

But despite its many advantages—lower resin and rinse water requirements; smaller, more compact equipment—continuous ion exchange must still compete with older, established processes. Fixed-bed ion exchange, for example, has proved its versatility in a number of applications. And, an engineering and economic evaluation by SRI has indicated that continuous countercurrent devices are economical only for ion removal, not for ion separation. The continuous technique is generally more economical for removing ions at high throughputs (as in water softening and demineralizing); fixed-bed exchange is better for separations where high purity and recovery are the criteria.

But Porter is confident that his column will win jobs, sees immediate use for it in uranium processing, deionization of sugar, and purification of brackish water in the water-short Intermountain area. If the unit lives up to advance notices, chances are there'll be plenty of processors eager to try it out.

At **GENERAL ELECTRIC'S** Appliance Park,
chemicals handling includes
DURCO equipment like this



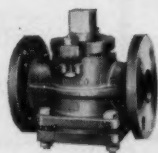
Series
R Durcopumps



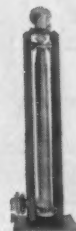
Series R Self-priming
Durcopumps



Durco Type J "Y"
Valves



Durco Type F
Valves



Durco Tantalum Tube
Heat Exchangers



Durco No. 4A Heat
Exchangers



Duriron
Bell and Spigot Pipe
and Fittings and
Duriron Flanged Pipe
and Fittings



Durco Tank Outlets



Durco Steam Jets

There are Durco products in corrosive service in many plants throughout the world. In none is there a greater variety of Durco equipment than in the General Electric Appliance Park Plant, Louisville. From GE's giant continuous spray pickling machines, through pickle waste handling, through anodizing and plating processes, and

the waste treatment plant—Durco products are on the job. Many were original equipment, more are being specified as replacement on tough service jobs.

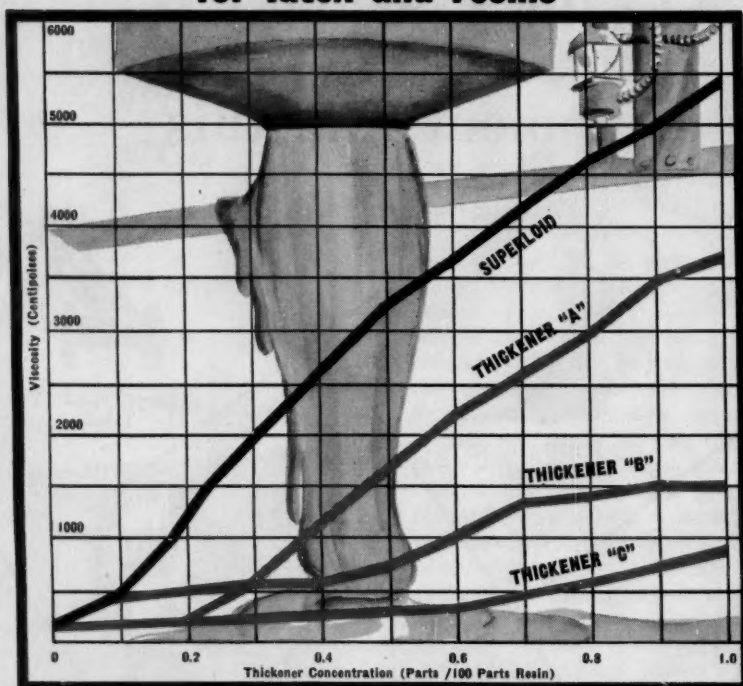
Details on Durco products may be obtained by writing The Duriron Company, Inc., Dayton 1, Ohio.

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PRODUCTION

4-Way Responsibility

A chemical plant manager always has to answer to his own management. But when it comes to pollution, he also has to answer to the public, the local enforcement or control agency and the personnel of his plant. He can go a long way toward making them all happy, though, if he keeps a few simple rules in mind—as outlined by F. Leonard Bryant, works manager of Hooker's Niagara plant, at the Air Pollution Control Assn. meeting in Buffalo recently (see p. 32).

As Bryant sees it, the plant manager's job in most cases involves taking orders from his own management, translating them into action within the plant and then reporting back on what he's done. But when dealing with pollution, he's got a few extra dimensions thrown in. Specifically, he has responsibilities to four parties.

- The public. The plant manager has a real responsibility toward the community in which his plant operates. It isn't enough to know what the plant's effluents are; he has to know what the people think they are and how they feel about them.

- Control agencies. Bryant feels that, by and large, control officials have a better understanding of the difficulties inherent in dealing with so complex and technical a subject as pollution. They are, therefore, easier to deal with than the public. By the same token, he should cooperate with them.

- Plant and personnel. The third responsibility is toward the plant and its personnel. The manager should lay down a carefully thought out anti-pollution program, then make every effort to get the plant personnel to cooperate in carrying it out. He should assign a man the job of administering the program, a man high enough in the organization to assure progress and yet one who has enough time to devote to it.

- Management. His responsibility to management is to report on the status of the program and to make sure that the firm's money is spent wisely.

When the four responsibilities are weighted properly and when management shows an active interest in the program, a plant manager can make his pollution problems a matter of history.

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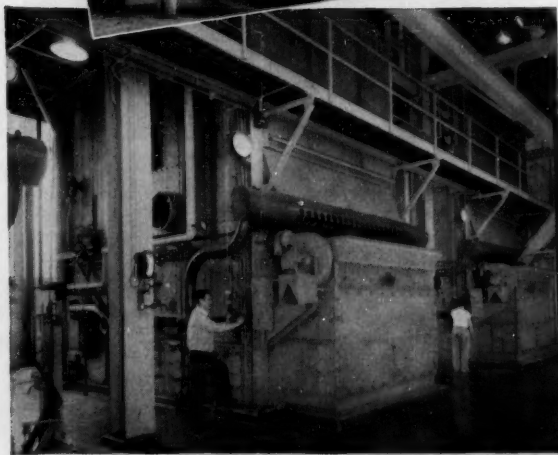
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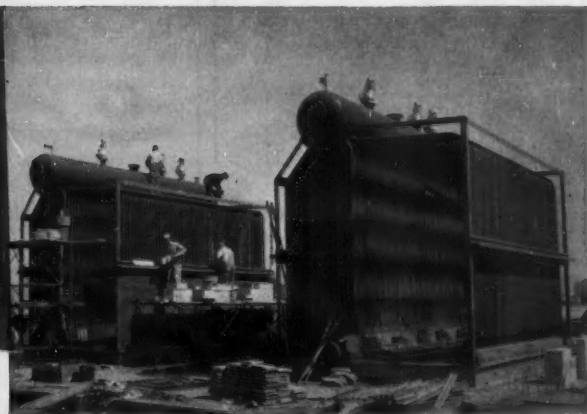
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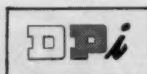
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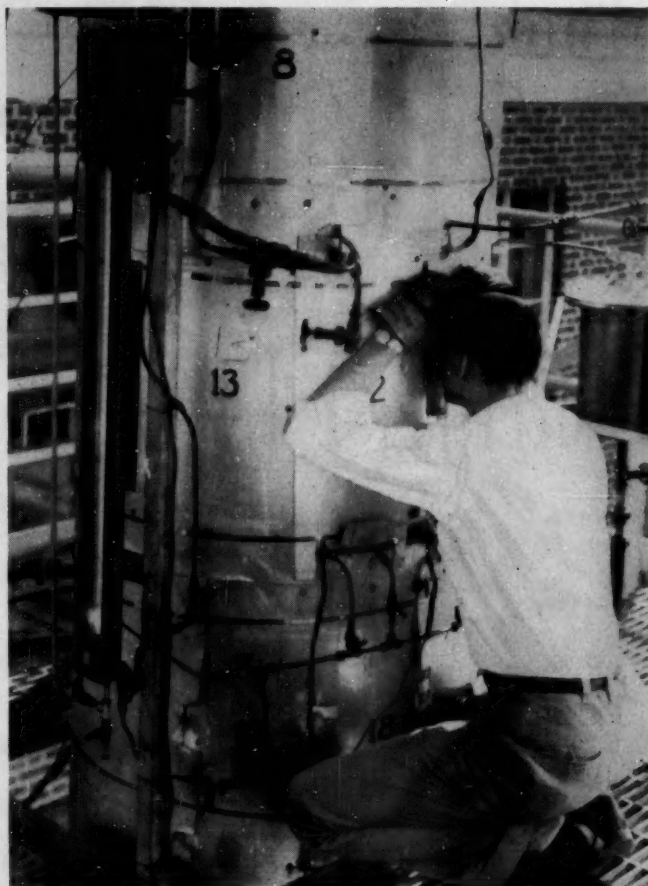
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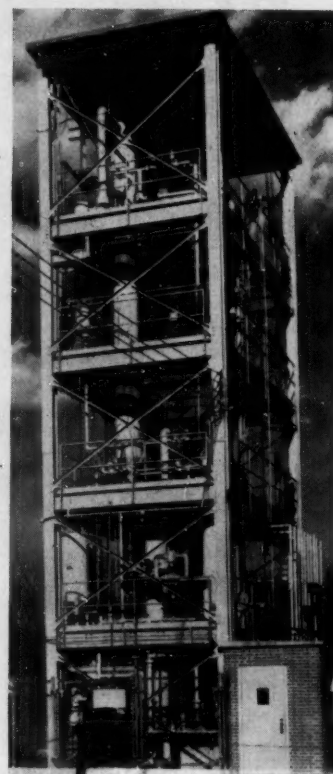


DELAWARE DISTILLATION: Studies on commercial scale are . . .

Filling the Gaps

When it comes to chemical process design, experience helps engineers to bridge the gap between theory and practice; but what they don't know would fill books. And while such weighty tomes may never be written, a few chapters, at least, are now being compiled by an industry-sponsored group of distillation experts.

Organized under the American Institute of Chemical Engineers and backed by 39 leading members of the chemical process industries, the distillation studies are being conducted at the University of Delaware, the University of Michigan and North Carolina State College. Heading into its fifth and final year next month, the program delves deeper than any pre-





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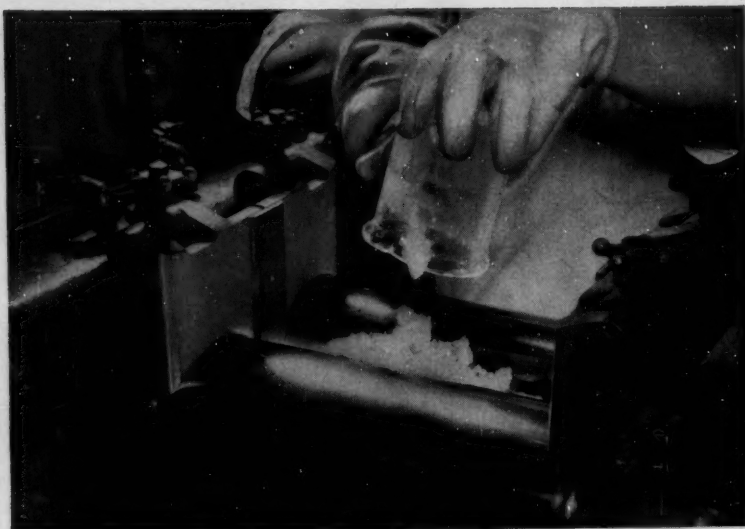
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M-31

PRODUCTION

vious research into the operation of fractionating towers under actual production conditions. Some of the answers it hopes to supply:

- Effect of operating and design variables on distillation efficiency.
- Effect of the nature of the system on efficiency.
- A more accurate method of calculating estimated efficiencies.

Full-Scale Tests: Unlike pure research studies, which investigate physical phenomena in laboratory equipment under ideal conditions, these tests are being conducted in small, commercial-scale equipment.

The distillation column at the University of Delaware, for example, is 15 ft. high, has a 2-ft. diameter to eliminate wall effects. The shell and tray decks were designed and constructed by Badger Manufacturing Co. (Cambridge, Mass.); internals (5 bubble trays adjustable for tray spacings from 1-2½ ft.) were devised by the university staff.

Other features not found on commercial units are the test tower's numerous vapor- and liquid-sampling devices, observation windows to permit viewing bubble tray action.

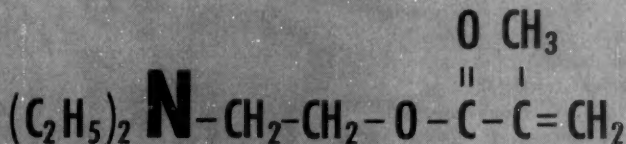
Operation of the Delaware column is directed by Jack Gerster, professor of chemical engineering at the school. Tests are run by graduate students, cover a wide range of commercial operating conditions, including gas rates not far from flooding. It's the first time, says Gerster, that any group has amassed comprehensive data on actual efficiencies over so broad a range.

Of course, similar data could be gleaned from industrial units, but not for as many different sets of conditions. Production economies being what they are, experimentation in commercial units is justified only if it will be of immediate benefit to the operation of a given installation. And, even then, conditions are limited to the narrow range within which the column must operate.

Rapid Return: Collecting the distillation data has, so far, cost the industrial sponsors about \$80,000/year, may run to about \$100,000 for the fifth and final year. But it's an investment that promises big dividends.

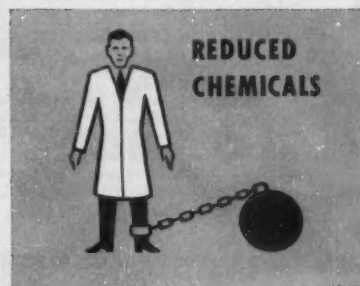
Eventually, the complete results will be fully released for general use. But participating sponsors are already benefiting from the results obtained so

CAN YOU PICK THE RIGHT ANSWERS IN THIS 30-Second Quiz on Intermediates?



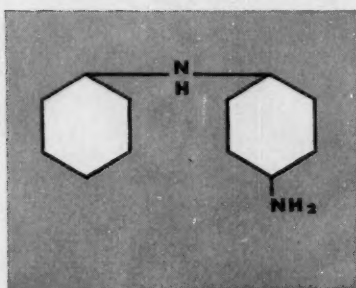
1. Above you see the formula for Du Pont 2-Diethylaminoethylmethacrylate. A real long fellow—a real useful one, too. Chemists are finding it very helpful as:

- ☐ A. Catalyst in petroleum refining
- ☐ B. Means of incorporating a basic site into a polymer
- ☐ C. A weed-killer ingredient



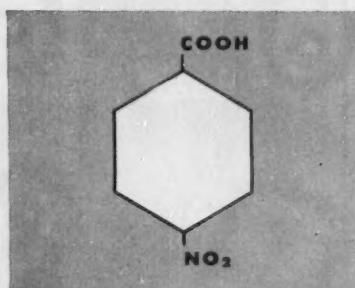
2. Is the problem of making your own reduced chemicals slowing you down? A sure way to free yourself is to:

- ☐ A. Leave them oxidized
- ☐ B. Devote still more time to the problem
- ☐ C. Consult Du Pont



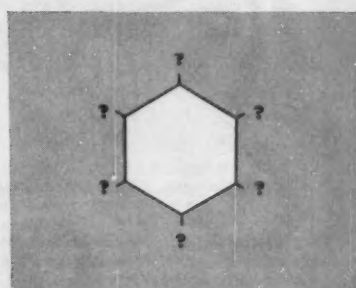
3. Du Pont p-Aminodiphenylamine is used for a number of important uses. Among them are:

- ☐ A. Building block for antioxidants
- ☐ B. Dispersion medium for colloids
- ☐ C. Promoter in polymerization of polyesters



4. Meet Du Pont p-Nitrobenzoic acid. You may have heard about its use in:

- ☐ A. Stabilizing polyvinyl chlorides
- ☐ B. Preparing local and topical anesthetics
- ☐ C. Emulsion stabilizing



5. Suppose you have an unusual intermediate in mind. Your first move should be:

- ☐ A. Write Du Pont
- ☐ B. Consult Du Pont
- ☐ C. Call Du Pont by phone

• If you have a problem with intermediates, be sure to contact Du Pont—manufacturer of the greatest variety of these chemicals offered by any company. Our resources are at your disposal in finding, or even in manufacturing, the intermediate for your own specific needs.

Now, let's check your score on the quiz. Here are the answers: 1-B; 2-C; 3-A; 4-B; and 5—just take your choice!

Du Pont offers a complete line of intermediates containing nitro, amino and sulfo groups. And our specialists are always ready to give you a hand in selection and application—just drop us a note and we'll gladly try to help: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Div., Wilmington 98, Delaware.



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PRODUCTION

far. One company reports that test data have been helpful in predicting with greater accuracy the number of plates required for a given separation. Another has used test results to confirm its present tray designs, hopes to incorporate more of the information in its future design work.

And the universities have profited, too, says Gerster. Because it adds a dimension of commercial reality to the textbook theory of distillation, the program is a boon to graduate student training. And as these students move into industry, even this educational benefit will, in the end, revert to the sponsoring chemical companies.

EQUIPMENT

Dust Detective: Its new Automatic Recording Dust Detective, says Phoenix Precision Instrument Co. (Philadelphia), measures a wide range of air-borne dust concentrators on a single scale. The dust that would form a 0.001-in. layer on a ¼-in. head-diameter nail, will give 20% of full-scale deflection if uniformly dispersed in 1,200 cu. ft. It will also read the concentration of a dust fog that reduces visibility to 30 ft.

Chlorinators: Two new chlorinators, featuring a V-notch Variable-Orifice



WIDE WORLD

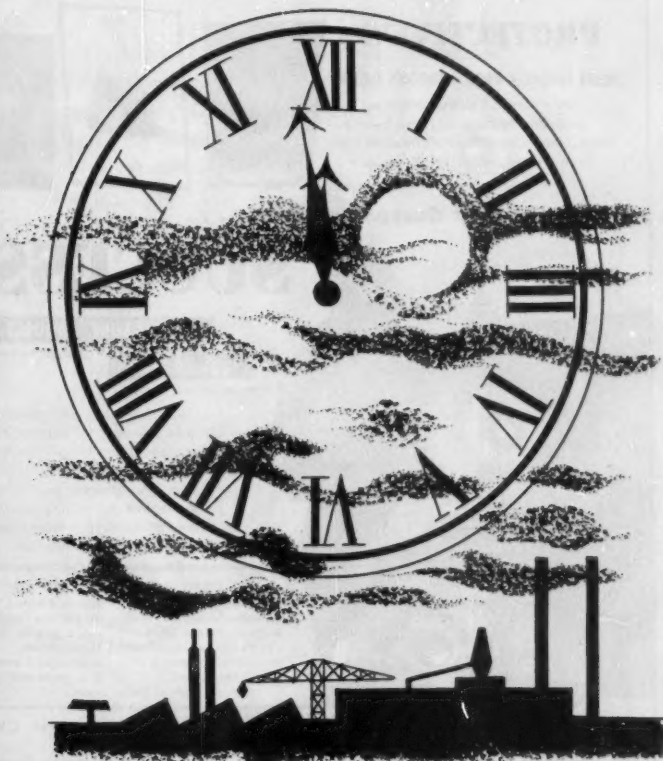
Radioactivity Ups the Ante

STAKES ARE HIGH when you're dealing with safety hazards in atomic energy plants. To guard against serious losses, stray radioactivity must be carefully counted, constantly checked. One of the newest devices for spotting potential hazards is an automatic radiation counter (above) developed by

Beckman Instruments (Fullerton, Calif.). Nuclear "poker chips," holding hundreds of samples of materials from atomic processing areas, are scanned by counter to locate "hot" spots. Within minutes, the machine pinpoints sources of alpha and beta radiation, tallies results on a printed form.

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PRODUCTION

for metering and control, have been introduced by Wallace & Tiernan Inc. (Belleville, N.J.). The V-notch Variable-Orifice reportedly maintains accuracy of set feed rate within 4%. Series A-712 Wide Range Model covers a V-notch feed range of 20 to 1; Series A-711 covers a rotameter feed range of 10 to 1. Chlorinator capacities are 25-2,000 lbs. of feed per 24 hours.

Pneumatic Timer: General Electric's General-Purpose Control Dept. (Schenectady, N.Y.) has recently developed a rugged, dust- and moisture-free, pneumatic timer for automatic control circuits. The time delay is one-fifth of a second to 180 seconds, with an accuracy of plus or minus 10% of the setting. Units can be supplied with a maximum of two instantaneous interlocks. Timing element with contacts is available separately.

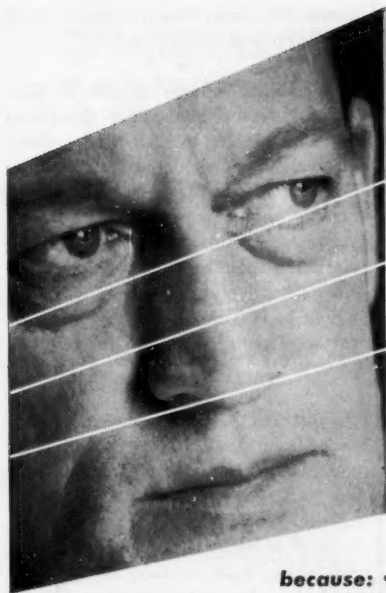
Automatic Bagging: High-speed, automatic proportioning and bagging of dry ingredients is carried out with the new Weighblender of Richardson Scale Co. (Clifton, N.J.). Unit employs a series of three scales, permits blending of ingredients as they enter sacks. Individual measurements are said to be accurate to 1-2 oz. for 25- to 100-lb. bags.

Steam-traced Joint: Tendency of product to freeze in flanged joints between sections of Unitrace, Alcoa's (Pittsburgh) integrally extruded, steam-traced aluminum pipe, is minimized by a new cast flange recently added to the line. The flange features built-in product and steam-tracing lines, mates with standard 150-lb., 2-in. ASA pipe flanges and fittings.

Quick Coupling: Snap-Tite, Inc. (Union City, Pa.) offers its new HK coupling for fast connect-disconnect pipeline for acids, alkalis, and high-pressure steam in range from —100 to 500 F. The coupling features Teflon nipple and valve seals, comes in ½- to 3-in. I.D. pipe sizes.

Heavy Mover: For fraction-of-an-inch control in the handling of large equipment and other heavy loads, R. G. LeTourneau, Inc. (Longview, Tex.) has a new power-rotated jib crane with lifting capacities to 15 tons. The unit's 25-ft. boom rotates

A complete up-to-date report on the facilities and advantages of Calvert City is now available. Write National Carbide for a copy of "Industrial Resources, Calvert City, Kentucky" — Prepared by the Joint Civic Industrial Committee of Calvert City, and The Agricultural and Industrial Development Board of Kentucky.



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PRODUCTION

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Industrial Filter: IWF Industrial Filter made by R. P. Adams Co., Inc. (Buffalo) is designed for high-flow backwash, eliminates disassembly for cleaning. Poro-Stone, Poro-Carbon, Poro-Screen or Poro-Edge filter elements may be selected for process needs. The new filter works on batch or continuous operations.

Air Filter: A new, oil-bath air filter offering low-pressure-drop operation is available from Air-Maze Corp. (Cleveland). Called the LPD filter, it employs no moving parts, requires no outside energy supply—works by reversing the conventional oil and air circuit. Capacities for variable-speed engines and compressors range from 800 to 24,000 cfm. with pressure drops varying from 0.6- to 4.8-in. water gage.

Protective Coating: Carboline Co. (St. Louis) now supplies a modified phenolic coating, called Phenoline 305, for resistance to splash, spillage and fumes of acids, alkalis and solvents. It is applied in two coats, each 6 mils thick, over sandblasted or wire-brushed steel, wood or concrete. Coverage is estimated as 200 sq.ft./gal.

Pipe Sealer: Chem'l on is a new Teflon-base pipe joint compound, put out by Crane Packing Co. (Morton Grove, Ill.), for positive sealing of corrosive-liquid and solvent pipeline in services to 212 F. Particularly adaptable for use on aluminum, stainless steel, Monel or plastic pipe, Chem'l on is nonadhesive, nonhardening, is said to permit connections to be disassembled easily even after years of severe service.

Rotary Condenser Still: Arthur F. Smith Co. (Rochester, N.Y.) has developed a new, rotary condenser, high-vacuum still for separating mixtures in the molecular-weight range of 200-700. The still has an all-glass column with internal, stainless steel, air-cooled rotary condenser that condenses the distillate, throws it back to the warm

keeping up with

SODIUM

Sodium handling in the plant

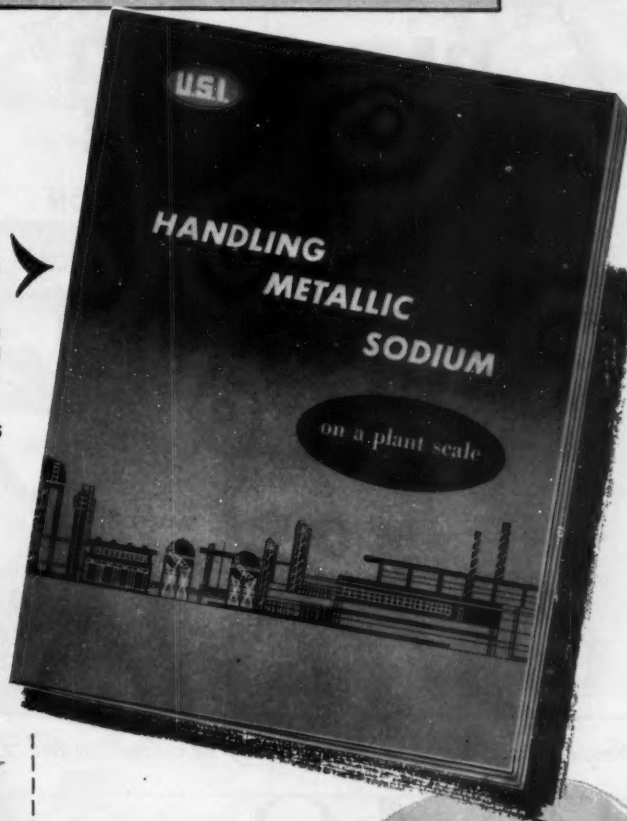
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THIS BOOK IS FOR ENGINEERS AND PRODUCTION MEN WORKING IN DESIGN, DEVELOPMENT AND OPERATION OF SODIUM HANDLING EQUIPMENT.

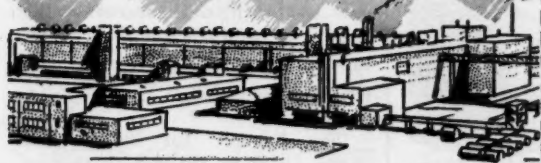
CONTAINS INFORMATION SUCH AS—

- DETAILS OF TYPICAL SODIUM-USING PROCESSES
- DETAILS OF EQUIPMENT INSTALLATION, INSULATION, HEATING, REPAIR
- RECOMMENDATIONS FOR SODIUM PUMPING, METERING, INSTRUMENTATION
- SAFETY IN DESIGN AND OPERATION

FORTY-FOUR PAGES OF DETAILED INFORMATION ON SODIUM HANDLING BASED ON IN-PLANT EXPERIENCE. NO SUBSTITUTE FOR DIRECT U.S.I. TECHNICAL ASSISTANCE, THIS BOOK WILL NEVERTHELESS PROVIDE THE READER WITH A SOLID FOUNDATION IN THE PRINCIPLES AND PRACTICES OF SODIUM ENGINEERING. AVAILABLE FROM U.S.I. WITHOUT CHARGE.



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- THAT SODIUM PIPELINES CAN BE CUT AND REWELDED WITHOUT DRAINING?
- THAT SODIUM BRICKS ARE MOLDED IN OPEN AIR?
- THAT MOLTEN SODIUM CAN BE PUMPED AND METERED CONTINUOUSLY?
- THAT THE ATOMIC ENERGY COMMISSION HAS STUDIED OVER 60 CONSTRUCTION MATERIALS FOR SODIUM HANDLING?

RESULTS OF THE A.E.C. STUDIES, ALONG WITH MANY OTHER DETAILS OF SODIUM HANDLING TECHNOLOGY, ARE PRESENTED IN U.S.I.'S NEW BOOK.

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Titre	128.8°—129.7°F.
Color 5/16" Lovibond Red	0.7 max.
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Unsaponifiable	0.05% max.
Saponification Value	208 — 212
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Iodine Value (WIJS)	5.0 — 6.5

In the history of fats and waxes

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PRODUCTION

evaporative surface by centrifugal force. Standing 82 in. high, it has a capacity up to 2 liters, vacuum range to 0.1 micron hg.

Refractory Patching: A new, tough, basic refractory patching material that provides a rapid-setting chemical bond is supplied by Kaiser Chemicals Division, Kaiser Aluminum & Chemical Corp. (Oakland Calif.). Tagged 1020 Periclase Patch, it is a companion to Kaiser 102 Periclase ramming mix for high-frequency induction furnace linings. Both materials have high electrical resistance and will absorb several times their weight of iron oxide.

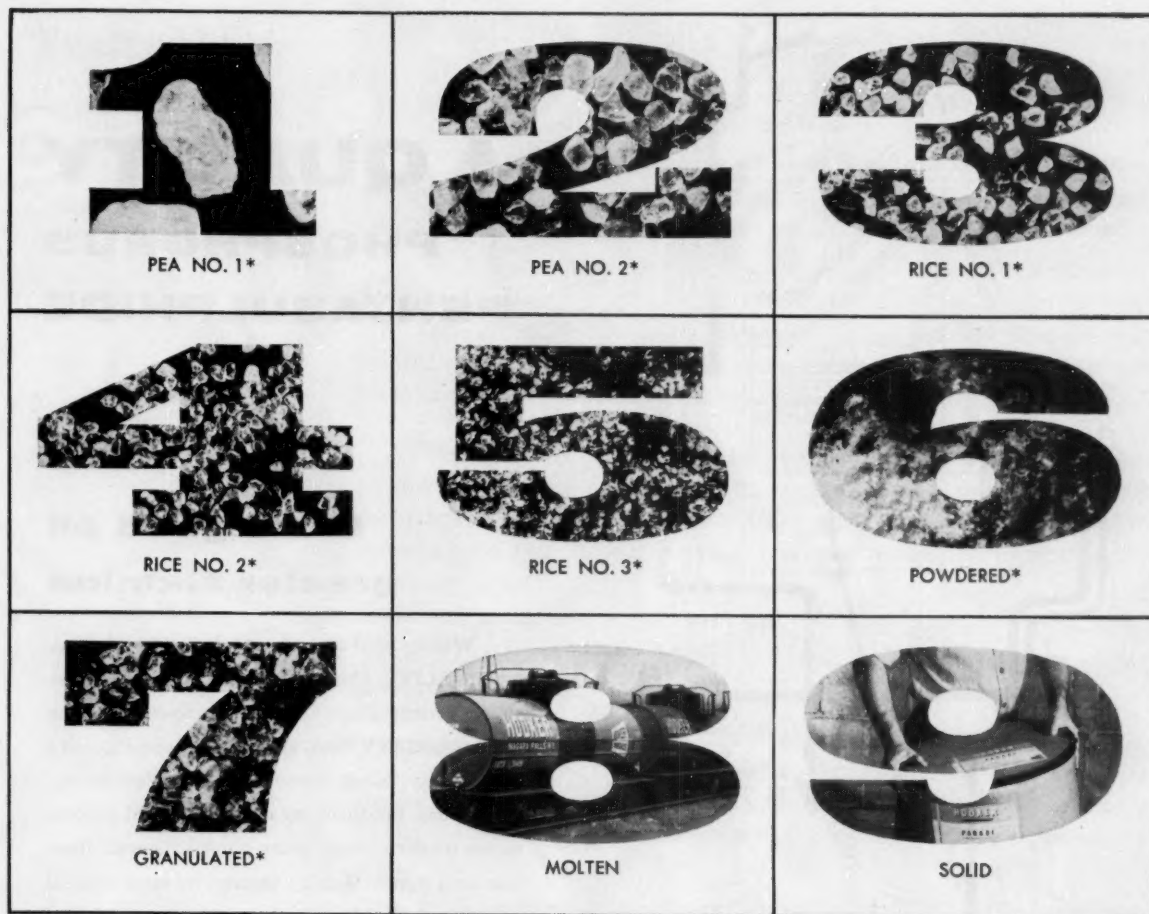
Null Indicator: Improved readability contained in the same panel space as conventional, round instruments is the feature of its new 2½-in. MM-2 null indicator, says Marion Electrical Instrument Co. (Manchester, N.H.). This addition to the Medalist line is available in ½-, 1- and 2-ua/mm sensitivities at null point, with respective full-scale current ratings of 100, 200 and 500 ua.

Joint Wrap: Duratape, a parallel-reinforced, glass fiber mat for pipeline joint wrapping, now has almost double its former tensile strength, claims its maker, L.O.F. Glass Fibers Co. (Toledo, O.). Designed for hand wrapping of field joints and fittings for corrosion protection, its new tensile strength averages 55 lbs. per inch of width.

Also available from LOF is a high-temperature, abrasion-resistant, glass-strand yarn with a Teflon coating that is applied before braiding. The yarn can be used as a sewing thread where chemical resistance is required.

Pipe Bender: Tal Bender, Inc. (Milwaukee) is out with a new remote-control device—the RC 200 One Shot bender—for bending pipe, rigid conduit, copper tubing, etc., to any angle with a single setting. The lightweight unit (68 lbs. complete) comes with bending shoes for 1- to 2-in. or ½- to 2-in. sizes, can also be supplied with an electrically powered pump.

Chemical Packing: For long life in corrosive service, Abbott & Biddle (Philadelphia) recommends its new 405 mechanical packing—a combination of braided glass and Teflon fibers.



*Actual Size

9 ways to make money with paradichlorobenzene

Going to market this year with a line of paradichlorobenzene products?

We'd like to help you do it, successfully.

How? By furnishing any of the sizes you need, economically from one source.

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dies must be refilled rapidly. *Rice No. 3*, slightly smaller, is sized especially for foot-operated presses. It's free-flowing, yet packs with very little effort. And if you melt-and-mold, consider *Powdered*—a fine, fast-melting size that's easily colored and perfumed.

Agricultural selling You'll find *Granulated* a handy bulk-package size. It's often recommended for broadcasting as a weed-killer, and in control of certain insects and fungi.

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use 50 or more tons per month? You may save by grinding and screening PARADI yourself. You can buy *molten* PARADI for this purpose, in tank cars—or *solid* PARADI, cast into drums.

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See for yourself how PARADI helps you put maximum sales appeal into your product, and lightens your processing or repackaging job. Write today on your business letterhead for literature and samples of the sizes that match your needs.

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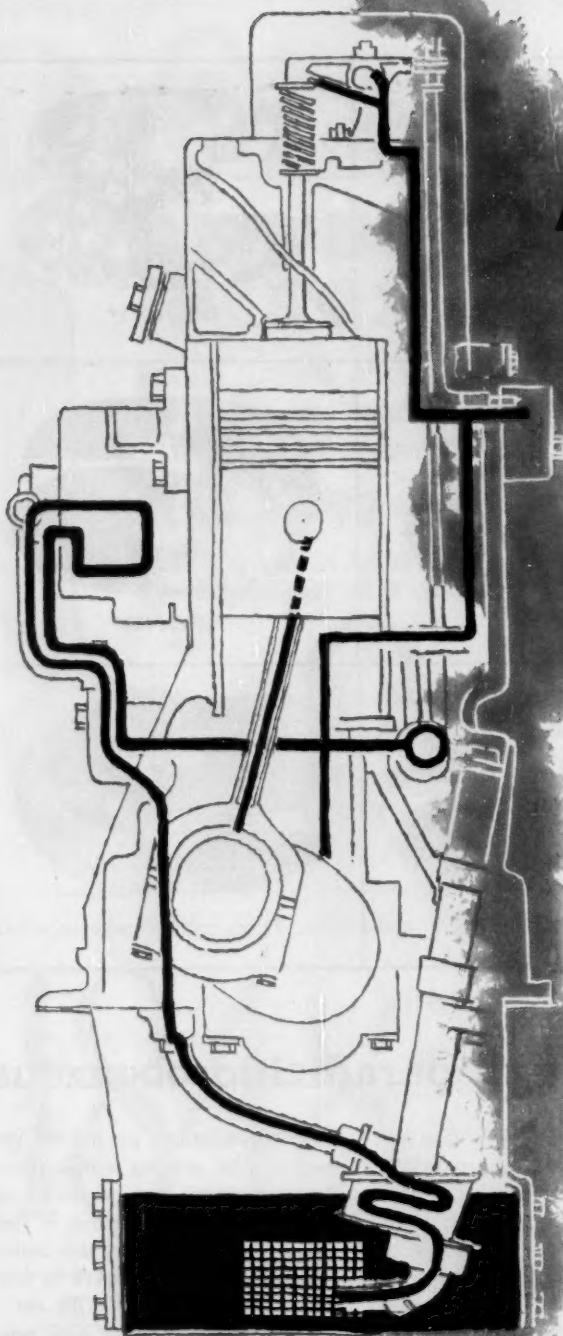
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Technology

Newsletter

CHEMICAL WEEK

June 9, 1956

You can expect to hear more about a thermal diffusion separation process being worked up by the University of Tennessee's Prof. S. H. Jury and Edward Von Halle, a graduate student working under a Du Pont fellowship.

Although the theory of the process has been only partly understood, the idea is to introduce a liquid (or gas) between two plates, one hot and the other cold. There are more molecular collisions near the hot wall than there are near the cold wall. So, depending on mass, shape, etc., certain types of molecules will tend to concentrate near one wall or the other.

Atomic energy researchers have put this principle to work in gaseous separations. And Standard Oil (Ohio) has applied it to liquid separations, proved the technique capable of some really tricky separations. Sohio engineers, for instance, used it to separate the three isomers of xylene and to separate the isomers of heptane.

Jury and Von Halle have modified the Sohio approach. They're working on horizontal, rather than vertical, columns; also using membranes in conjunction with the temperature gradient.

Allis-Chalmers has just opened a pilot plant to test and demonstrate the A-C-L cement process (*CW*, Jan. 28, '56, p. 92). Developed by Otto George Lellep, a German inventor, the process in this country is owned exclusively by Allis-Chalmers.

It employs a double-pass preheat system that is said to offer cleanliness, compactness and big fuel economies. In fact, the process is so clean that Marquette Cement Mfg. Co. won approval of a strict city commission to use the process in a plant to be built in downtown Milwaukee.

Allis-Chalmers feels that the process can save between \$100,000 and \$200,000/year on fuel for plants having annual capacities of 1-1.3 million bbls.

Work by Shell Development now indicates that shelf life of fat-containing food products packaged in paperboard can be hiked considerably by incorporating an anti-oxidant into the paperboard. Ionol (2,6-di-*tert*-butyl-4-methylphenol), for example, at a 0.5% level in the paperboard, retarded rancidity (as measured organoleptically) for 90 days in foods kept at high temperature.

Blaw-Knox Chemical Plants Division has received a contract for what may be the world's largest vegetable oil deodorizing system: a plant—for Honey-mead Products Co. (Mankato, Minn.)—to deodorize the oil from 18 million bu./year of soybeans. This will amount to roughly 8% of the nation's processing capacity.

Blaw-Knox is also building a big vegetable oil extraction system for the same firm. B-K will put its Rotocel extractor to work in a plant to treat 1,200 tons/day of soybeans. This is a replacement for a 500-tons/day unit built for Honey-mead by Blaw-Knox in 1953.

Technology

Newsletter

(Continued)

Two patents issued to Du Pont shed more light on the firm's Lusane Blue B, the phthalocyanine dye (*CW*, March 24, p. 88) that's said to have four times the tinctorial strength of vat and direct dyes: U. S. patents 2,741,531 and 2,741,534.

The first shows how metal-free phthalocyanine blue can be dissolved in an alkali-aliphatic mixture and the solution padded on cloth. When the cloth is treated with water, the pigment is regenerated in the fiber to yield a brilliant and strong dye.

The second puts the phthalocyanine into solution by using a quaternary ammonium hydroxide in such basic solvents as pyridine and quinoline. Regeneration is carried out as in the first process.

Koppers is going to place even more emphasis on coal-tar research. At the 285-acre tract at Arroya, W. Va., where it's building its new nicotinic acid plant (*see p. 21*), it is also putting up a development plant that will concentrate on methods of upgrading coal-tar chemicals. Primarily, it will try to extract additional chemicals from the tar.

Dow this week is bringing out a new thermoplastic, Styrex 767, based on styrene and acrylonitrile. It's said to have good resistance to heat and cold and many solvents and chemicals, also to have a high degree of clarity in transparent colors. And, according to Dow, it can be produced in a range of opaque colors. Dow is building a plant to make the new resin in Midland, says that it hopes to eventually produce it in a variety of formulations.

Dow's new resin will probably be competitive in some applications with Cyanamid's Cymac 201, the copolymer of acrylonitrile and methylstyrene that Cyanamid formally unveiled last week.

And the new resins of both will have to compete with Bakelite's copolymer of styrene and acrylonitrile, C-11.

At this week's Atoms, Electrons and Industry Exhibition in the Royal West of England Academy (Bristol), Pilkington Brothers, Ltd. (London) will show off a new stabilized lead plate glass intended for protective uses in nuclear research.

Conventional lead plate glass does an excellent shielding job. But it's so dense that large pieces are unwieldy. The British firm has managed to reduce the density with its new ceria-stabilized glass. Now, it feels, lead glass can be used to provide much broader window vision than was formerly practical.

Colored tires? Not yet, but Phillips Petroleum is working on it. Phillips has made experimental colored tires using its Marlex 50 linear polyethylene blended in with the rubber.

NEW



SYNTHETIC WAX

EPOLENE is a new low-viscosity,
low-molecular weight polyethylene wax—
highly compatible and
exceptionally uniform in quality

Epolene is a new synthetic wax, offering users the double advantages of steady supply and stable price.

Epolene is a hard, *tough* wax, comparing favorably in this respect with high-priced natural waxes such as carnauba. It is compatible with a wide range of other waxes, elastomers and resins. Its inherent toughness and its ability to plasticize other materials to which it is added extends its usefulness. Epolene is highly resistant to the attack of many chemicals and is not dissolved by organic solvents at room temperature. In polishes, it produces films of high gloss, high slip resistance and good scuff resistance.

Blended with other waxes, it increases hardness, melting point, blocking temperature, dielectric strength, abrasion resistance, toughness and flexibility.

Epolene is available in two forms: Epolene "N"—a non-emulsifiable type for direct blending with paraffin and other materials; Epolene "E"—an emulsifiable type for the preparation of emulsions used in the manufacture

of polishes, paper, textile finishes and other coatings.

Epolene is easy to use. It comes in the form of pellets approximating the size of rice grains. These melt down rapidly for incorporation with other materials. In upgrading paraffin, Epolene can be quickly blended with the paraffin at temperatures as low as 180° F.

The outstanding uniformity of Epolene also contributes to its easy use and makes possible exact control of wax blending or emulsifying. Viscosity is low and carefully maintained from shipment to shipment. The acid number of the emulsifiable type is held within the narrow limits of 9–10. By standardizing on Epolene you can standardize your formulas and procedures.

Investigate the possible usefulness of Epolene in your product. Its versatile properties make it an interesting commercial material for many uses. For samples and further information, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, Chemicals Division, KINGSPORT, TENNESSEE.



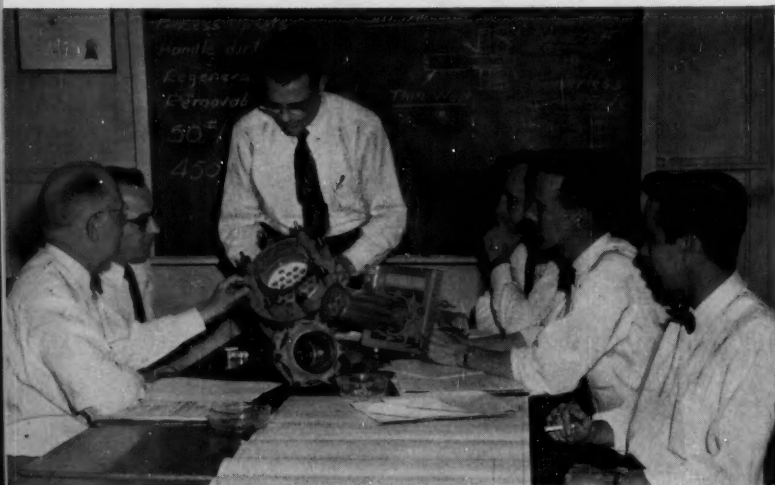
OLD VERSUS NEW.

Scoop of Epolene pellets is shown alongside broken slabs of standard commercial wax. The convenient form of Epolene saves considerable time and expense in handling and processing.

Epolene

EASTMAN POLYETHYLENE WAXES

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



ROUNDUP: Corning's Callard describes results of customer panel survey.

- Several companies are now using consumer panels to evaluate new products for industrial markets.
- Method offers rapid and inexpensive way to estimate a new product's suitability and potential sales in a given market.
- Application of consumer panels to commercial chemical development might come if several hurdles can be cleared.

Product Development: Panels Catch On

In at least several far-separated corners of the chemical process industries, and in other areas, too, new product development is getting a new twist. At Corning Glass, Minnesota Mining and the Hermon W. Stevens Agency (Boston), the consumer panel method of evaluating new products is being applied to industrial commodities.

This panel approach to industrial market research, the firms report, offers a quick and inexpensive way to test the worth of possible commercial-volume products. And in some cases, a good statistical estimate of the probable market can be obtained early in the development process.

Although the system resembles the conventional, "ask a few customers to experiment with the product" technique of commercial chemical development, a fine, but important, distinction exists. The consumer panel consists of a group of companies selected from the ranks of potential customers. They are asked to critically appraise new products or new product ideas. Opinions are requested well before management commits the company to full production. This differs from the conventional approach in two major aspects:

- Degree of formalization. Customers that agree to participate can expect to be surveyed regularly.
- Statistical correlation. In some

instances, to arrive at an estimate of the total market, the quantity of a new product that a panel member might use is combined with data on his share of the entire industry market. This is done in advance of large-scale production and sometimes even before pilot-plant production.

How It Works: Consumer panel methods and their use vary, of course, with the individual company. Corning Glass incorporates its version into a broad, three-point, market development program: idea, preliminary, and full-development phases.

- **Idea stage:** Following conception of a product idea, the Sales department estimates the general business prospects, the Product Engineering department roughs out several alternative designs, estimates performance, production capability and costs. Management also considers the marketing organization, patents, the specific production process and the facilities available.

- **Preliminary development:** If the product idea survives the idea stage, Product Engineering further evaluates engineering feasibility and then consults the consumer panel.

Corning's panel members (about 10) are chosen on the basis of lack of prejudice against glass, a "strong sense of optimistic discontent," geographical location, willingness to make a trial,

experience with plant operating problems, and sound, practical evaluation.

Panelists judge such factors as product merit, limitations, possible improvements, worth in process operation, and the price they would be willing to pay. In some instances, the members call in other company personnel, even some from outside the firm. With this information (gathered by interview), Product Engineering is ready for the next step—if warranted.

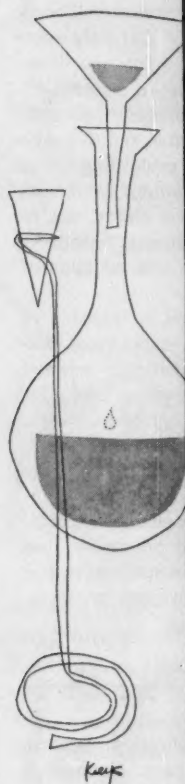
- **Full development:** Sales, Manufacturing and Product Engineering team to advance the project toward limited-scale production. Once again, the consumer panel is consulted—this time for evaluations of revised designs, prototypes, packaging and laboratory tests. A limited-sales phase follows, and then full-scale marketing efforts complete the process.

Robert Callard, supervising engineer and contact man for the panel members, cites these two big benefits to Corning from the panel approach:

- The method affords appraisal in depth rather than in breadth of a product idea. And it's done before expenditure of large sums for development.

- Exhaustive scrutiny of complex end-usage can be obtained.

There's also benefit for the customer, he adds. Their cooperation results in better products.



today, there is a safer, simpler, surer way to store gas. The antiquated bell jar was the prototype of many gasholders still in use. The modern Wiggins gasholder, using a 100% dry seal, is the first successful departure from "bell jar" construction.

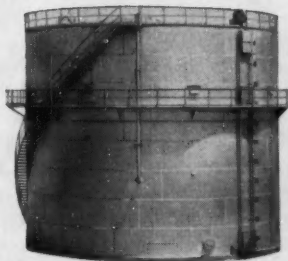


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SALES

Although Corning gets "some idea" of the possible dollar-and-cents market from the panel, it isn't basically a statistical device. Stevens Agency, however, does take a statistical tack. Its "panel of industry engineers" (see p. 98) is representatively picked from each major Standard Industrial Classification of the U.S. Dept. of Commerce. Minnesota Mining's Industrial Tape Division uses still a third variation.

Statistical Territory: The Tape Division solicits customer opinion relatively late, uses the concept as a preliminary to conventional test marketing. Technical service personnel sound out about six representative customers. Chief goal: to uncover technical shortcomings in its tape.

The test-marketing program, however, is now being replaced by a further refinement in the panel concept—the "representative territory."

One area of the country is so chosen that it contains a good cross section of tape-using industry. A "field market-

ing man" is permanently assigned to sell new products in the section. Although he sells, his main function is analytical.

It's his job to select representative tape consumers (in effect, a panel) in the section, learn how much tape they use, what prices they pay, what industries they serve, how the new tape works in use, and what the competition is doing. In short, this man knows "everything there is to know about tape as it is used in the territory." From data he channels back to the home office, the company says it can estimate the entire national market. And, the same man gathers slants on the best sales pitches, need for special salesman training and other marketing aspects. "Extremely successful" is the way the division terms the system's results.

For Chemicals: What use can commercial chemical development make of the panel approach? Some feel that the idea is at least worth a close examination. Others are skeptical of con-

sumer panels being successfully adapted to chemical development. The reason: Whether a chemical will work well is often a matter that only comprehensive experimentation can determine. Estimates of a chemical's usefulness by questionnaire and without actual formulation or reaction data could be extremely misleading. And, because major applications sometimes pop up in unexpected places, use of the same panel members repeatedly might not produce a true estimate of a product's potential.

Still, the idea might be capable of complementing current practices. Experimentation by statistically selected companies that have a reputation for sound judgment might produce rough, early estimates of market potential.

Questionnaires might gauge early interest, be followed later by conventional chemical development practices. And there's also the possibility that the consumer panel method might find a place in finished chemical products, such as molded plastics.



AIM OF the Stevens Agency's system is to analyze market potential and product design specifications simultaneously and quickly. To do this, the company selects representatives of firms in each of the U.S. Dept. of Commerce's major industrial classifications as panel members. These firms account for about 10% of the industry in each classification.

Panel members supply detailed data about themselves and their company's position in the market, and are responsible for answering questionnaires about product usefulness, design, modifications, and the quantity of a new product they could use at an estimated price.

Questionnaires are tailor-made; a separate form is prepared for each

possible product application. Several panel members in each Commerce Dept. group are canvassed. The query is passed to the man in the company most qualified to answer. Generally, no panelist will be surveyed more than 20 times/year.

By combining questionnaire answers, business data the company originally supplied, and information in the literature, the agency claims that a market can be estimated.

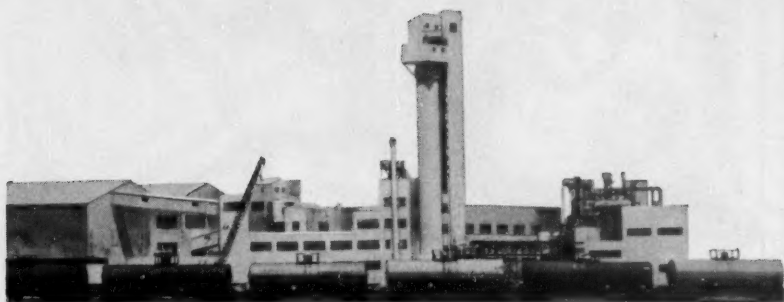
Incentive for the panel member—who contributes data, time and opinions gratis—are:

- He can influence final design and price to better suit his needs.
- He has advance knowledge of new products, can be among the first to employ it or to get a "jump" on the industry.

So far, Stevens has used the method mainly for market research on electronic instruments. Extension of the system to chemicals, however, is definitely contemplated. The panel director, M. H. Jennings, believes modifications in the method will be required when it is applied to the chemical industry. Panelists may have to perform some experimentation in addition to answering questionnaires.

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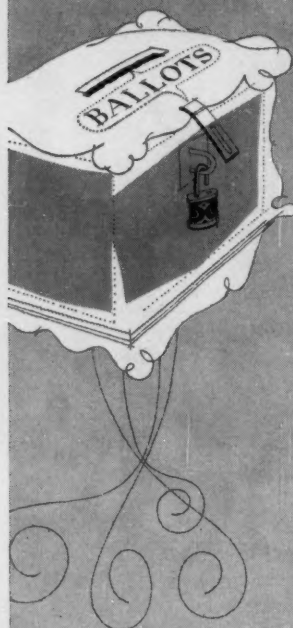
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Sulphonated Fatty Oils are more important than ever before! Manufacturers everywhere—in such diversified fields as textiles, paper, leather, polishes, printing inks and adhesives—are turning to these agents because of their increased value and many new uses.

Jacques Wolf & Co., leading sulphonor for over half a century, offers a complete line of sulphonated oils—vastly improved by advanced methods. Write for samples and further information.

JACQUES WOLF & CO.
Chemicals PASSAIC, N.J.

Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

SALES



CARBOY acid buyers get tank-car advantages as distributors move toward . . .

'Milk-Route' Delivery

Small-volume acid users don't have to be hamstrung by the excess handling usually associated with carboy quantities of materials. Proof of this is the method used in Chicago and Milwaukee by Merchants Chemical Co. to provide its customers with truckload convenience when they place little orders.

Merchants has set up a system—resembling a milk route—to sell acids in bulk quantities to the small customer, has put together some quite convincing arguments to woo him away from carboys.

At least two of the big guns in Merchants' sales spiel: lower price of material in 500-1,000-gal. quantities; reduction of hidden handling costs.

Merchants, operating a fleet of compartmentalized tank trucks to handle sulfuric and hydrochloric acids, has since early this year been plying their weekly "milk route" delivery trade.

Each truck has four 500-gal. compartments. Two (Herosite lined) carry either battery-grade or regular-grade sulfuric acid; two (rubber lined) are for various grades of muriatic acid.

A compartment takes about 20 minutes to unload—considerably less than it would take to unload full carboys. Usual arrangement is for Mer-

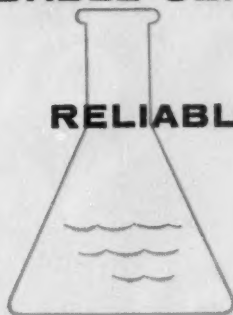
chants and its customer to work together on design of the storage tanks for the acids. At present, Merchants recommends storage tanks of 750 or 1,350 gal. depending on the customer's needs. These sizes—after some trial-and-error testing—appear to be the most practical for both the users and the supplier. Usual practice is for a truck driver to make the necessary connection and disconnection from the customer's receiving line—with one of the customer's employees present to supervise and assist the driver. The truck is completely equipped with air pressure and pumps for withdrawing acid.

Merchants has worked out some figures that build a good case for its service. Example: On 1,000 gal. of tech. sulfuric 66 Bé, delivery by the compartmented truck will replace 75 carboys, result in cost saving of 43%. Installation cost for the 1,350-gal. tank required runs about \$1,000, but Merchants claims that the customer can pay off such cost in a year on the savings realized by using only 42 tons of material.

The company also avers that customers fail to realize the number of carboys broken during the year, with concomitant loss of carboy deposit and—more expensively—the loss of spilled acid.



DEPENDABLE SERVICE



RELIABLE QUALITY

YOU GET BOTH WITH

COLUMBIA-SOUTHERN CHROME CHEMICALS

SODIUM BICHROMATE

SODIUM CHROMATE

POTASSIUM BICHROMATE

Write today for this new booklet which describes the Columbia Chrome Chemicals, gives packaging and uses, outlines handling practices.

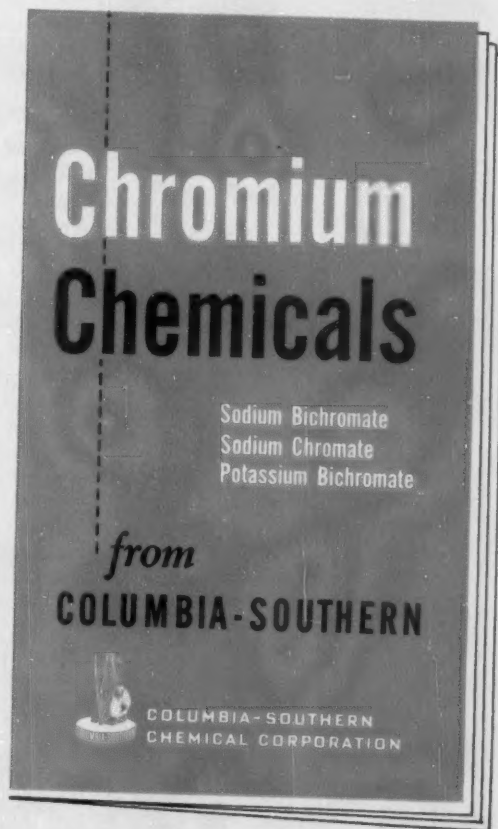
Please send your request to the address below.

**COLUMBIA-SOUTHERN
CHEMICAL CORPORATION**

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER • PITTSBURGH 22 • PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas • Houston • Pittsburgh • Philadelphia • San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division



ELEMENTAL BORON in commercial quantities

manufactured
to meet your
specific needs!

Today's elemental boron, no longer a laboratory curiosity, is a fast-growing chemical with important commercial aspects. For those working in Boron Chemistry, Trona* now offers several grades of elemental boron to meet your specific needs. Trona, a world leader in the development of commercial boron, has the technical know-how and production facilities to fill your orders in any quantity without delay.

CURRENT FIELDS OF APPLICATION:

In the Military, elemental boron is being used in Ordnance applications for flares, fuses, ignitors, and propellant mixtures. Commercially, it is used in borides for high temperature applications, and with plastics for lightweight neutron shields.

To get more information about Trona's special grades of elemental boron, call your Trona technical representative today.

TRONA

Contact Sales Development Department

American Potash & Chemical Corporation

3030 W. Sixth St. 99 Park Avenue
Los Angeles 54 New York 16
DUckirk 2-8231 OXford 7-0544

*TRADE MARK AP&CC

SALES



ANSUL'S GLENN WILPOT: One 'star' in a series of . . .

Ads for Service

The "personal" touch, long an asset in promoting business in retail shops, has apparently hit the chemical trade, too. Ansul Chemical, currently running some ads in business magazines spotlighting technical personnel, is finding it a good way to stress one of the company's big talking points—service. Carbide, too, is trying the same technique in promoting activated carbon solvent recovery plants.

Many other chemical companies have more money, more complete product lines, and certainly more salesmen than has Ansul. "But," claims the firm's management, "our technical men can really give personal attention to our customers. We're turning the smallness into an advantage."

Typical personnel-touting ad shows a technical man surrounded by paraphernalia of his profession, uses copy that stresses his particular specialty, urges customers to contact him directly with their problems. Sample blurb: "For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville."

By such friendly, informal-introduction approaches, plus highlighting of the "expert's" integrity and know-how, Ansul believes that the confidence inspired in the customer will inevitably carry over to the company's products.

Ansul, of course, is comparatively small, and, as a company spokesman explains it, "almost anyone who makes the products we do, could make the same claims for them; but our ads put across the idea of personalized service and extra attention."

How do Ansul's people feel about the "nonconventional ad approach"? So far there's been no problem—cooperation has been good. And there's been no jealousy yet, since nearly all the technical personnel connected with the company's industrial chemicals have been featured at one time or another (*see cut*). The campaign has been running for a few months, will close at the end of the year. But if the ads to come are as successful as those which have run, chances are the company will continue the series.

Results, says Ansul, have been excellent so far; "we're doing even better this year than we did last."

In other product lines, fire equipment, for example, Ansul has also found the personal approach a good one. People outside the company have been featured in the ads; one: Floyd Dumas, chief of fire prevention for Parke, Davis, in a fire equipment ad.

But whether using company personnel or others, the benefit is the same: by imparting a personal quality, Ansul has come up with a profitable departure from the conventional product-claim approach.



You'll Reduce Costs 4 Ways When You Order **PITTSBURGH MOLTEN PHTHALIC!**

USERS of phthalic anhydride in flake form specify *Pittsburgh* because they like the uniform quality, reliable deliveries and the convenience of *Pittsburgh* "Quick-Open" bags. But if you have facilities for receiving tank truck or tank car shipments of *Pittsburgh* Phthalic Anhydride in *molten* form, you'll enjoy these important cost-saving advantages, too:

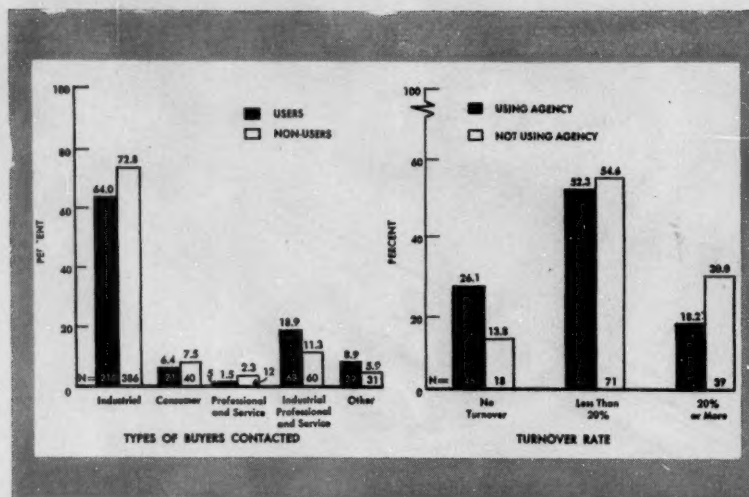
1. Lower cost-per-pound.
2. Lower handling costs.
3. Less warehousing and inventory space.
4. Reduced processing time.

And remember: *Pittsburgh* is doubling its phthalic output this year . . . greater assurance than ever of *prompt* deliveries in *any* quantity when you buy from *basic Pittsburgh!*



WSW 6016

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON



BREAKDOWN (left) of aptitude test use by type of industry solicited; right, how internal vs. external test administration compare by turnover rate.

Tests Spot Sales Talent

Chemical companies, one of the big advocates of the psychological testing methods in recruiting salesmen, have a good opportunity to measure themselves against a cross section of the whole American industry.

Just released this month is a survey—the joint effort of the National Sales Executives, Inc., and E. M. Goldwag (New York University marketing lecturer)—which tries to answer some questions on the use of psychological tests in selecting salesmen.

Of 890 respondents—all U.S. companies that employ full-time outside salesmen—328 (36.9%) are now using psychological tests in selecting salesmen. Comparison between users and nonusers of the tests shows these characteristics:

- Users are usually manufacturers that have principal products ranging in price from \$50 to \$1,000 and sales forces averaging more than 100. Also, the typical company has been in business 40 years or more, has total yearly sales volume of over \$1 million, and a turnover rate of less than 20%; its salesmen who call on industrial, professional and services purchasers, were recruited by the company through newspaper ads, employment agencies and their own salesmen's recommendations.

- Nonusers of psychological testing seem to be less like the average chem-

ical company than the users. Most common nonuser characteristics: most often wholesalers; sell consumer goods; have chief products averaging less than \$50 in price; employ less than 20 salesmen, who usually call on industrial purchasers only. These salesmen (the turnover rate is higher than 20%) have been recruited by application in person, promotion from within, and the companies' own salesmen's recommendations.

Highest proportion of companies using the tests was reported from the East North Central states (12.4%) and Middle Atlantic areas (8.4%). New York alone accounted for almost 4.8%.

The larger the sales force, the more tests are used. And these are more often used in branch offices with more than seven salesmen, and in home office operations employing more than 19 salesmen.

One reason why the branch office is more a fertile field for use of the tests is that the manager is often the only company official in a position to judge a candidate, and tendency is to rely on extra tools to assist him in selecting the most promising applicants. In the home office, there are more adequate facilities and personnel available to evaluate the applicant, to expose him to interviews with company executives.

Where salesmen call on industrial

buyers only, there is less inclination to use tests; where salesmen must also call on professional people (engineers, architects, etc.), more reliance is placed on testing.

One of the primary motives for using the tests is apparently the high rate of turnover in salesmen, the theory being that faulty selection is one reason why personnel leave.

It's hard to summarize all the conclusions derived from the survey—because of the large number of these conclusions and because of the qualifications necessarily attendant upon any such study. But a careful perusal of the work should be rewarding for anyone concerned with employing and holding good salesmen, as well as giving a good idea where their company fits into the over-all employment practice picture.

DATA DIGEST

- **Ethyl silicate:** 18-p. brochure tells how the compound is used in precision casting. Information on the hydrolysis, gelation, setting, typical formulas, analysis, specifications and prices are included. Montrose Chemical Co. (Newark, N.J.).

- **Rigid vinyl extrusion compound:** 12-p. booklet supplies data on physical and chemical properties, processing, limitations and price. General Tire & Rubber Co., Chemical Division (Akron, O.).

- **Graphite in atomic energy use:** 6-p. folder tabulates typical properties of graphite, gives facts on strength-to-weight ratio and tensile strength as a function of temperature, points out uses in atomic energy equipment. National Carbon Co. (New York).

- **Butyl octyl phthalate:** Brochure describes compatibility of the distilled ester with several resins, suggests applications as a replacement for dibutyl phthalate in nitrocellulose lacquers. Eastman Chemical Products, Inc. (Kingsport, Tenn.).

- **Resin-coated sand:** 16-p. bulletin outlines use of resin-coated sand for shell molding. Resins, sands, techniques, equipment, shell mold production and trouble-shooting sections are included. Monsanto Chemical Co. (Springfield, Mass.).

- **Fuming nitric acid handling:** Fourth annual report of the Air Force's continuing study of handling of fuming nitric acid describes corrosion and



Protect your product purity with **quality-controlled** shipping

Now you can extend the results of your own exacting quality control measures right to your customer's door. Quality controlled shipping in USS Steel Drums is the answer.

HERE'S WHY:

Both the inside *and* outside of every drum-body, head and bottom are completely descaled. Following this, all surfaces are purged with an alkali solution that removes every single trace of processing dirt and grease. The final step is to completely cover all surfaces of the drum-body and both ends with a special

phosphate solution that provides long-term protection from rust. These careful production steps add up to complete protection for your product — when your shipping is done in USS Steel Drums.

USS Steel Drums are available in sizes from 2½ to 110 gallons . . . plain or decorated. One of our many sizes and shapes of fittings is sure to meet your specifications.

"It's Better to Ship in Steel"

UNITED STATES STEEL PRODUCTS DIVISION

UNITED STATES STEEL CORPORATION

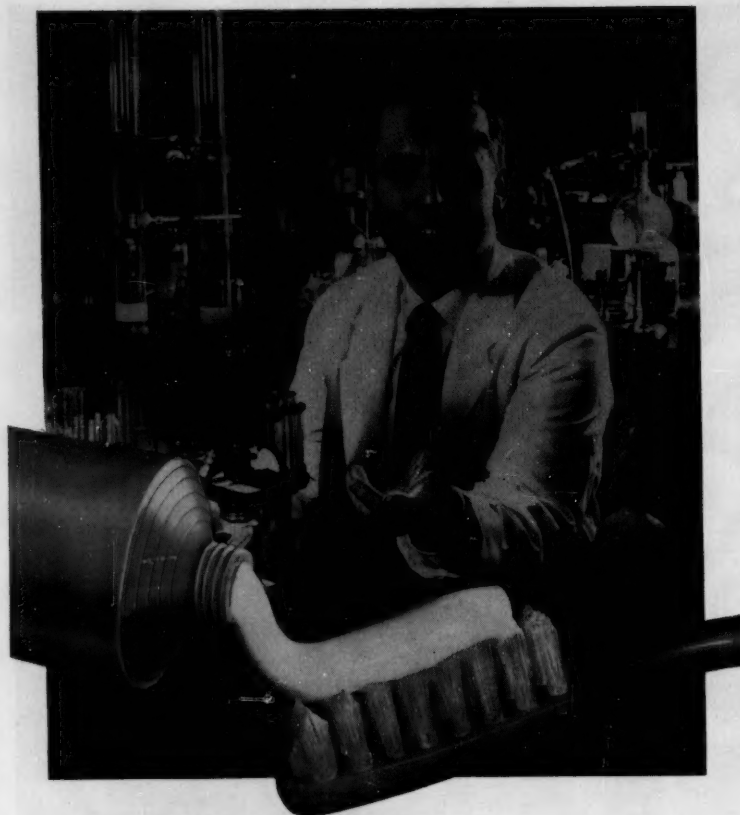
DEPT. 366, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

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Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

USS STEEL DRUMS



UNITED STATES STEEL



VEEGUM

where product texture determines sales

Take toothpaste, or any other product where smooth texture and stable consistency are basic sales appeals. With **VEEGUM** as a binding, bodying and emulsifying agent, ingredients won't separate during processing, shipping or storage. **VEEGUM'S** thixotropic properties and a tendency to thicken slightly with heat keep product consistency uniform over wide ranges of mechanical and thermal conditions — even repeated freeze-thaw cycles. Low concentrations of **VEEGUM** give high viscosities without stickiness for good stability at higher water loadings.

Inorganic **VEEGUM** is tasteless, odorless, opaque white and completely nontoxic. It is a highly refined magnesium aluminum silicate that is easily dispersed in water. These dispersions are compatible with alcohols, polyglycols and other organic solvents, and as little as 1% **VEEGUM** will permanently stabilize emulsions containing many types of oils, fats and waxes.

If better texture, consistency and stability will improve the usefulness and sales appeal of your products, write for **VEEGUM** samples and technical data today.

R. T. VANDERBILT CO. SPECIALTIES DEPARTMENT
230 PARK AVE., NEW YORK 17, N. Y.

☐ Please send **VEEGUM** Bulletin C53. ☐ Send **VEEGUM** sample.

(state application) _____

NAME _____

POSITION _____

(please write on or attach to company letterhead)

SALES

fatigue of containers, test equipment, and physical chemical experiments on nitric acid decomposition and the ratio of vapor volume to sample volume. PB 111950, \$3.50, Office of Technical Service, U.S. Dept. of Commerce (Washington, D.C.).

• **Adhesive bonding:** 8-p. brochure outlines application techniques, tips for long pot-life, speeding curing, and data on epoxy-base adhesives that cure without heat or pressure. Rubber & Asbestos Corp. (Bloomfield, N.J.).

• **Export opportunities:** The 30th quarterly installment of the Chemical Economics Handbook gives information on foreign demand for specialties, chemicals and pharmaceuticals. Stanford Research Institute (Menlo Park, Calif.).

• **Expendable pallets:** Booklet, "What You Should Know About Expendable Pallets," gives construction standards for parts and fastenings and allowable tolerances, definitions of terms and a "guide rule" for using expendable wooden pallets. National Wooden Pallet Manufacturers Assn. (Washington, D.C.).

• **Plastic ball bearings:** Comprehensive 115-p. report describes the application of plastics to roller and ball bearings. For the many plastics tested, the report gives data on test procedures, evaluations, comparative merits of different plastics, bearing design, and charts on load vs. deflection for balls of different diameter. Experiments were conducted for the Research and Development Division of the Detroit Arsenal. \$4.75, Kaydon Engineering Corp. (Muskegon, Mich.).

• **Multiwall bags:** Series of publications include separate manuals on palletizing, bag papers and printing. St. Regis Paper Co. (New York).

• **Home construction plastics:** 15-p. booklet describes uses of plastics for foundations, framing, finishing, built-in equipment and mechanical equipment in homes. Bakelite Co. (New York).

COMPETITION

• **Kaiser Aluminum & Chemical Corp.** is forming a new section in its product development department to coordinate styling as an integral part of developing new applications for aluminum.

• **Antara Chemicals**, sales division of General Aniline & Film Corp., has designated Denver Fire Clay Co.



Tannery calls Merchants' Milwaukee office. A large order of assorted chemicals is needed immediately. Products of six different manufacturers are included. Can Merchants make rush delivery?



184-piece order is made up from stock at Merchants' adjoining warehouse. A large inventory is maintained to fill customers' daily needs.

rush order:

TEN TONS OF ASSORTED CHEMICALS



Delivery is made an hour and 30 minutes from the time order was placed. Ten tons, 184 pieces — delivered immediately from a single source!

Merchants makes delivery in an hour and a half!

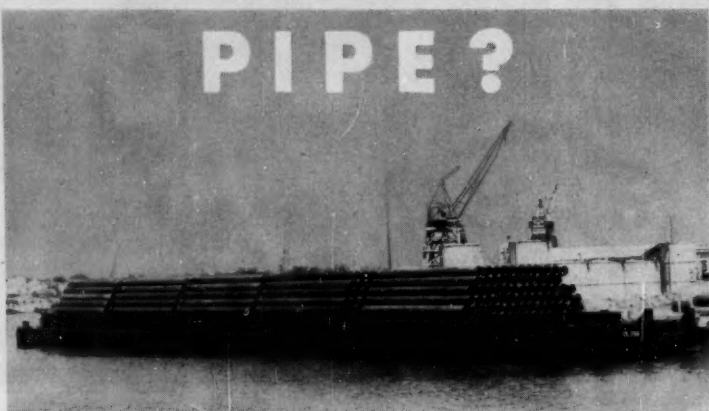
- Each Merchants' office is a single, reliable source for a wide assortment of chemicals. Because stocks at Merchants' warehouses are maintained with one consideration in mind — customer service — orders for assorted chemicals are filled rapidly and completely. For 35 years Merchants Chemical has given industrial chemical users this type of specialized service. Products include acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.



MERCHANTS CHEMICAL COMPANY, INC.

60 East 42nd Street, New York 17, N. Y.

SALES OFFICES AND WAREHOUSES: CHICAGO • CINCINNATI • DENVER • LOUISVILLE • MILWAUKEE • MINNEAPOLIS • NEW YORK • OMAHA
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**USE THE SOUTH'S MOST ADVANCED
BARGE LINES TO AND FROM GULF
AND INLAND PORTS**

Serving ports and intermediate points on the Gulf Intracoastal Waterways, Warrior and Tombigbee Rivers, and their connecting waterways in Texas, Louisiana, Mississippi, Alabama, Florida. Also principal ports and intermediate points on the Mississippi, Ohio, Illinois, Missouri, Tennessee and Cumberland Rivers and their tributaries.

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Established 1865

Member American Waterways Operators, Inc.

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**SHIP BY
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INTERMEDIATES!

- **DIPHENYLACETONITRILE**
—for analgesics, antispasmodics
- **3-NITROBENZOIC ACID**
—for anesthetics and ??*
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—for red dyes
- **1-PHENYL-3-METHYL-PYRAZOLONE-5**
—for yellow, green dyes

**why not send for a sample and tell us!*

Winthrop
LABORATORIES

SPECIAL CHEMICALS DEPARTMENT
1450 Broadway, New York 18, N. Y.

CW-66

SALES

to distribute surfactants, acetylene chemicals and carbonyl iron powders. The distributor will handle the areas of Colorado, Wyoming, Montana, western Texas, Utah, Idaho and New Mexico.

- Reckitt & Colman Ltd. has named Whittaker, Clark & Daniels, Inc., as exclusive distributor for Reckitt's Ultramarine Blues in the United States.

- Davison Chemical Co. (division of W. R. Grace & Co.) is tradenaming its synthetic petroleum catalysts Gyrocat.

- Hudson Pulp & Paper Corp. is coming out with a new trademark for its multiwall bags. The word "Betterbags" is superimposed on a circular emblem bearing the company's name and its sailing-ship symbol.

- Chemical Division of General Mills has designated Dearborn Chemical Co. (Chicago) as exclusive sales agents to the oil industry for fatty nitrogen compounds.

- Barada & Page, Inc., has opened an office and warehouse in Fort Worth, Tex., to sell agricultural and industrial chemicals.

- Varn Trading Co. (Jacksonville, Fla.) has designated Chematar, Inc. (New York) as domestic sales representatives for Varnos gum rosin.

- Arner Co. (Buffalo) is adding packaging facilities in Long Island City, N.Y., for its pharmaceutical products.

- Minerals & Chemicals Corp. of America (Menlo Park, N.J.) has appointed four new distributors to cover West Coast territory: E. M. Walls Co. (San Francisco), Chemical-Additives Co. (Vernon, Calif.), Cordano Chemical Co. (Portland, Ore.) and D. B. Smith Co. (Seattle).

- Rem-Cru Tithnium, Inc., has opened sales offices in New York and Chicago and has expanded its sales engineering staff.

- American Cyanamid Co. is adopting the trademark Cymel for its melamine molding compounds and resins.

- Stauffer Chemical Co. plans to build a new, 700-ft., \$300,000 dock at Louisville, Ky., to handle Chlorine and chlorinated chemicals.

- Pennsylvania Industrial Chemical Corp. is opening an office in Boston.

- Brown-Allen Chemicals, Inc., has named Ducros & Co. (Cleveland) and Barrett & Breen Co., Inc. (Boston) as distributors for the Ohio and New England areas, respectively.

Can AMMONIUM THIOCYANATE

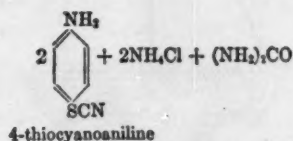
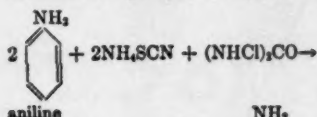
be used in your process?

available in crystalline form or 50-60% solution

1. The Thiocyanate group can be introduced into many organic compounds by reaction of ammonium thiocyanate with the corresponding halide.

2. Thiocyanogen can be generated by the electrolysis of an aqueous solution of ammonium thiocyanate.

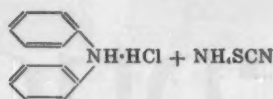
3. Aromatic thiocyanates can be prepared with ammonium thiocyanate with the aid of chloramides. The thiocyno group easily takes up the position para to the amine group, especially when one or both meta positions are vacant. If the position para to the amine group is occupied, the thiocyno group



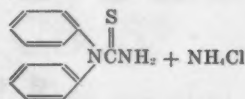
enters one of the ortho positions, but only with difficulty, with excessive heat liberation, and with the formation of a thiazole.

4. Some amine salts react with ammonium thiocyanate to give the corresponding amine thiocyanates.

5. Some amine salts yield the corresponding thioureas.



diphenylamine hydrochloride



N,N-diphenylthiourea

6. Guanidine thiocyanate may also be prepared in 90% yield by heating dicyandiamide with ammonium thiocyanate.

7. Amidines can be prepared by heating nitriles with ammonium thiocyanate at approximately 180°C.

8. 2-Thiohydantoin can be synthesized from acyl derivatives of α-amino acids with ammonium thiocyanate in acetic anhydride solution.

Baker Ammonium Thiocyanate is a product of synthesis stable at ordinary temperatures.* The crystalline material is soluble, clear, colorless, odorless. These advantages all contribute to economical, more trouble-free manufacturing.

Because Baker controls all of the raw materials that go into Baker Ammonium Thiocyanate, you are always assured of uniform quality, and scheduled availability.

Baker Ammonium Thiocyanate in crystalline form is packaged in 200, 100, and 25-pound fibre drums—all polyethylene-lined. The 50-60% Solution is available in 8000-gallon tank cars. For further information,

address: J. T. Baker Chemical Co., Executive Offices, Phillipsburg, N. J.

*Picks up moisture...should be kept in tightly closed containers.

FREE UPON REQUEST!

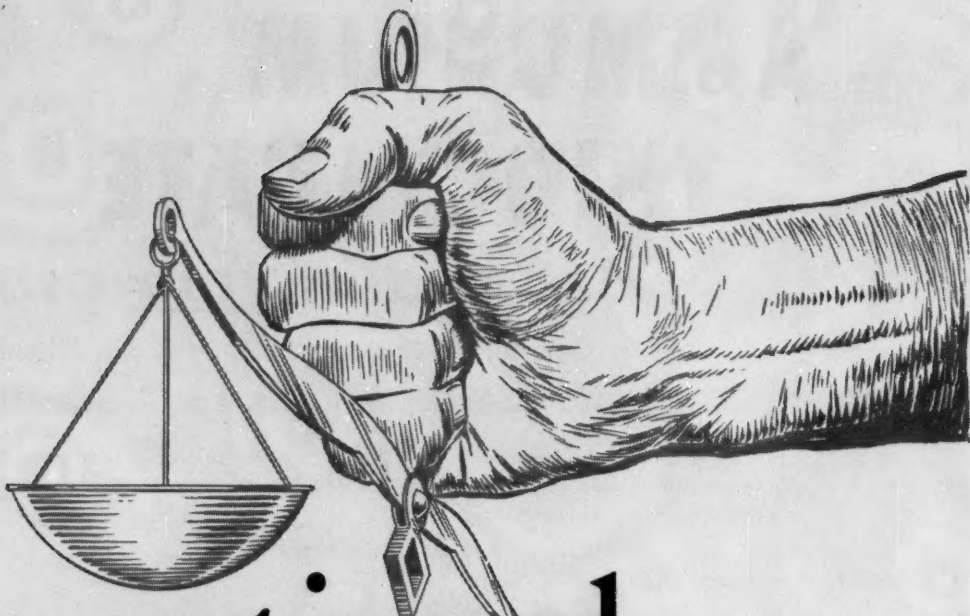
Valuable Ammonium Thiocyanate Product Bulletin giving data on its properties and uses of Ammonium Thiocyanate, properties of aqueous solutions of Ammonium Thiocyanate, etc. Address your request to J. T. Baker Chemical Co., Phillipsburg, N. J.



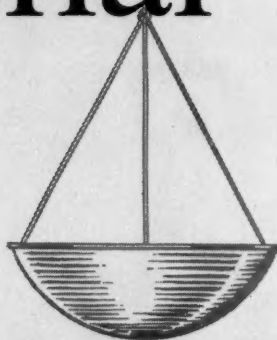
Baker Industrial Chemicals

"Purity by the ton"





exceptional quality



Mathieson Formaldehyde

Compare your specifications for formaldehyde with our regular production and you'll know why more users have standardized on the Mathieson product. And, rigid quality controls assure high purity *consistently* . . . tank car after tank car, truck after truck.

Mathieson Formaldehyde is supplied in four regular grades—37% inhibited, 37%, 45%, and 50% low methanol—available in tank cars and tank trucks from Morgantown, W. Va. Compare your requirements with our production . . . just call an Olin Mathieson representative.



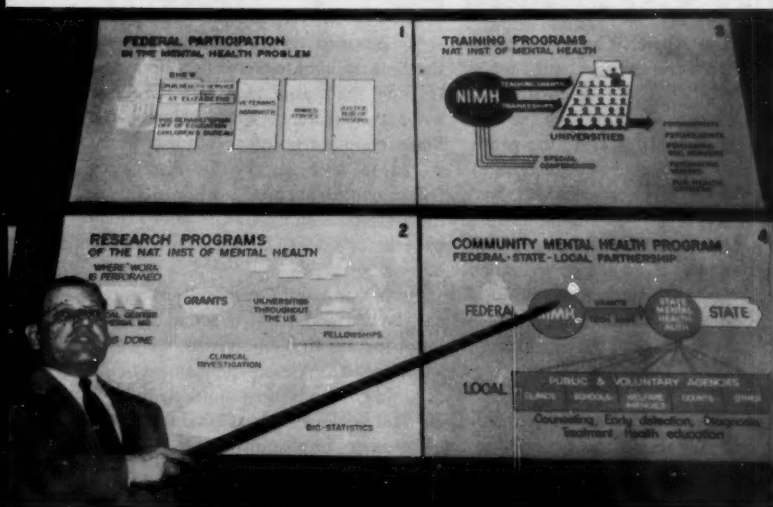
MATHIESON CHEMICALS

OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

39 52

INORGANIC CHEMICALS: Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives • Nitric Acid
Hypochlorite Products • Muriatic Acid • Nitrate of Soda • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) • Sulphuric Acid
ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylene • Formaldehyde
Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

RESEARCH



NIMH'S FELIX (left) and NMHC'S GORMAN: Both have a stake in the big question. . . .

Are Mental Drugs Really That Good?

Yes, say Mike Gorman (National Mental Health Committee) and Nathan Kline (American Psychiatric Assn.). Both want Robert Felix's NIMH to step in and make a tough, scientific evaluation.

And with more money from Congress in the offing, NIMH is likely to do just that. Here's what's going on now, what the outlook is for assessing the effectiveness of mental drugs.

IT NOW APPEARS almost certain that Congress will authorize a nationwide evaluation of the new tranquilizing drugs by the National Institute of Mental Health (Bethesda, Md.). The House has voted \$1 million for this purpose and the Senate Appropriations Committee is almost sure to go along—even hike the figure. If it does, it will go a long way toward pacifying such outspoken critics as Mike Gorman, executive secretary of the privately sponsored National Mental Health Committee, and Nathan Kline, research director of Rockland State Hospital (New York). Both have long been urging a critical evaluation of mental drugs.

Gorman avers that a tough, scientific evaluation is badly needed to clear up confusion arising from "a welter of claims and counterclaims" as to the drugs' effectiveness, is urging Congress to "require" NIMH to do the study. The institute, he says, has

been "dodging its responsibility" by not launching the study sooner.

His proposal: to convert the House's request for such research into a directive and to double the funds already allowed by the House—or \$2 million, half to finance the evaluation and half to support research on the drugs. This would result in a sharp step-up in fiscal year 1957 of work in this field.

Kline, who helped pioneer reserpine in mental therapy, is also present chairman of the American Psychiatric Assn. research committee. He has blueprinted for Congress a \$1-million evaluation project to be conducted over a two-year period. It would encompass 40,000 specially selected adult females at five mental hospitals (each in a different region of the U.S.), aim to evaluate the short-range effectiveness of reserpine and chlorpromazine. His proposed budget provides for a \$22,000/year project

director, operating under NIMH. And the plan includes a follow-up stage to evaluate long-term effectiveness of the drugs.

Cautious Haste: Robert Felix, director of NIMH, refuses to be drawn into controversy over Gorman's charges that the institute is "dodging" responsibility for carrying out a rigorous, nationwide evaluation program. He concedes, the institute hasn't sought to make such an evaluation. But the institute has about \$400,000 in outstanding grants for research on pharmacology. Most of this is going toward the study of such compounds as LSD (lysergic acid diethylamide) and serotonin (5-hydroxytryptamine). LSD is being used to create a body state similar to schizophrenia in the hope of uncovering new knowledge of the nature of this condition. Serotonin has an important role in brain function, may help spotlight how tranquilizers work (*CW*, Dec. 17, '55, p. 78).

NIMH also points out that it has been doing other work, cites a grant to the National Research Council that led to a conference last January of 18 scientists prominent in the mental health fields.

Privately, some NIMH scientists agree that the institute has been overly cautious in its approach. But now

RESEARCH

that the issue has been forced, they will welcome the chance to run the project.

Methods of carrying out an evaluation have come up in meetings of top agency staffers. So far, Felix has no plan ready. But he will be drafting one soon. The institute is joining with the American Psychiatric Assn. and the National Research Council to bring scientists and hospital administrators together in September for a pharmacological conference covering tranquilizers and other biochemical methods of treating mental illness.

NIMH will pay \$20,000 toward the cost of the conference. Drug manufacturers won't participate in working sessions of the conference, but will be invited to join in some open sessions. Also on the agenda: methodology of an evaluation program. Apparently the institute—if Congress gives it the money for evaluation—will have some

original ideas on how to evaluate the tranquilizers, and will be ready to air them at the September conference.

Full Steam Ahead: Gorman knows of the January conferences, but replies that only two of the 18 scientists had experience with tranquilizer drugs, that NIMH is "only tickling the problem." As for the broader conference to be held on the same subject this fall, Gorman says such conferences produce only meaningless "testimonials," tell only what is already known, notes that experts have conflicting opinions over the merits of the tranquilizers. Kline is also critical of NIMH's present approach of merely sponsoring conferences.

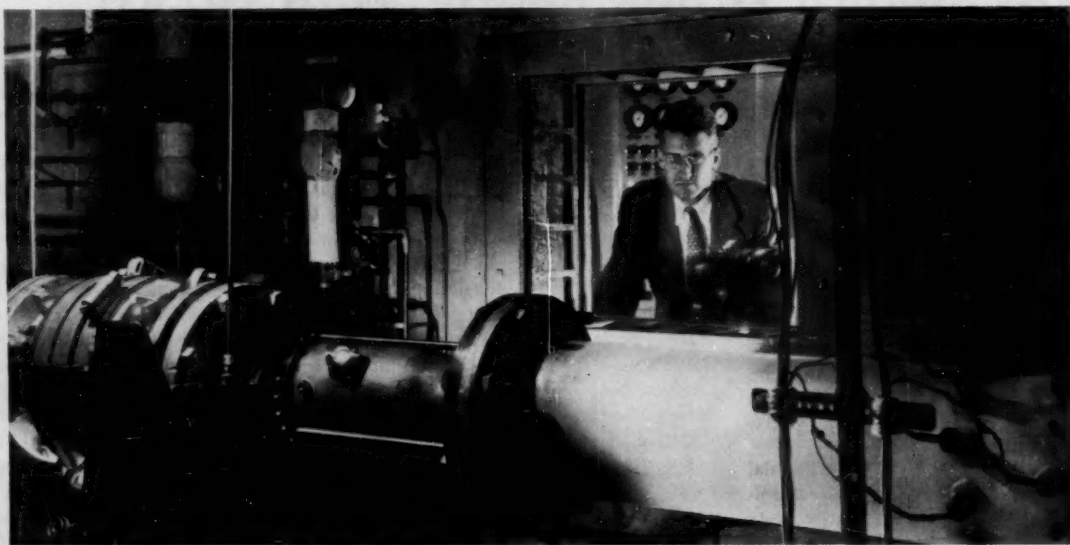
Gorman also concedes that evaluating the tranquilizing drugs will not be an easy job. Mental diseases arise from a variety of causes and the reasons for the therapeutic effects of the drugs aren't yet clear. In fact, he

says, there has never been a really good evaluation of any psychotherapy to date—including shock treatment.

By contrast, evaluation projects on the Salk vaccine were easier, he avers. But he maintains that the need for evaluation is there when "New York State claims use of tranquilizers resulted in a 23% rise in discharges from mental hospitals, while California hospital administrators claim their experience doesn't jibe with New York's results."

Both Kline and Gorman think much can be learned from a sound evaluation program that emphasizes statistics. Kline told Congress: "Pharmaceuticals capable of modifying thought, behavior and feeling may ultimately prove of greater importance than the introduction of atomic power."

"Chronologically, we are probably about where investigations of radioactive phenomena were at the turn of



Hot on the Trail of Better Jet Fuels

IN ITS NEW \$250,000 jet fuels laboratory (Beacon, N.Y.)—reputedly the nation's largest privately financed installation of its kind—the Texas Co. says it can now conduct combustion studies over practically the entire range of conditions encountered in air-breathing jet-type power plants. Charles Kubach, engineer in charge of the laboratory, is shown here observing a test run on the combustor section on a commercial turbo-prop engine. Intense heat generated by the burning fuel is

indicated by the glowing exhaust pipe (center). Says Frederic Holmes, vice-president in charge of the company's research and technical department: "The company will step up its development of new and improved fuels for all gas turbine engines, ranging from the supersonic jet giants with 10-ton thrust to the lightweight turbines being developed for the family car of tomorrow." By 1962, commercial airlines alone are expected to require 1.1 billion gal. of turbine fuel/year.

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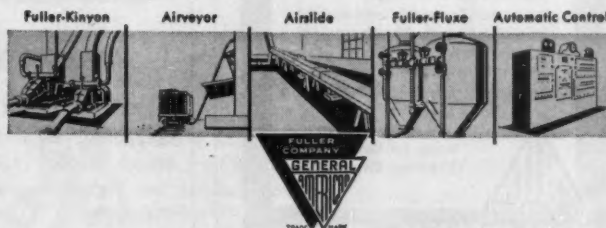
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the century. We are still fumbling at the beginning of knowledge, and what we do not know is much greater than what we do know. Projects involving the treatment of drug addicts, juvenile delinquents, and alcoholics have all shown promise. Our one great lack has been a definitive study on a nationwide basis."

Where to Stop? Meanwhile, it's not easy to find any criticism of NIMH among research directors of firms that have launched mental drugs. One director says that he is "impressed with the research they are doing now."

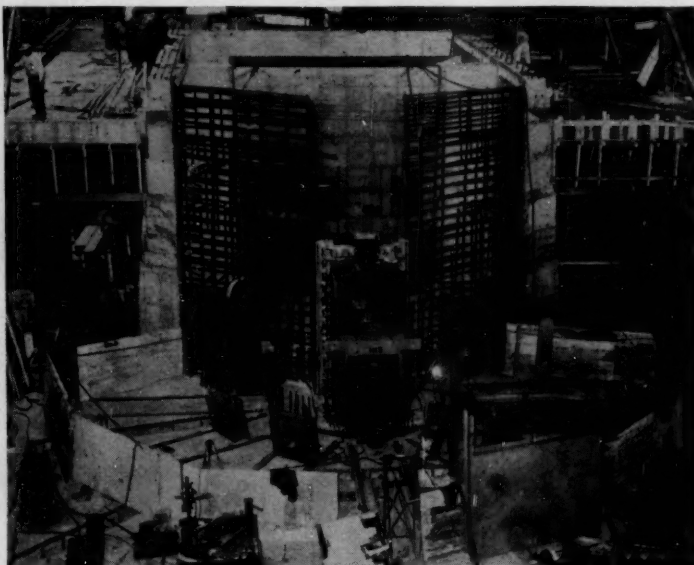
There's a feeling that no single institute will be able to make the final evaluation of drugs in mental diseases in any reasonable time, and that at best it can only hope to act as a referee. What's more, there's not likely to be any dearth of new mental drugs—the problem will be in assessing their usefulness.

It's quite probable that the drug

industry will welcome any increased research in the field by NIMH if such research is divided between clinical (or laboratory) studies and statistical assessment of reports from other sources, and if there is no discouragement of private research (e.g., via red tape in setting up rules for drug assessment) by the government.

NIMH is now caught in a cross-current between traditionalist psychiatrists (who are not yet wholly sold on the value of drugs in mental therapy) and those who emphasize the biological approach in trying to understand and cope with mental illness.

With pressures from all sides and with the prospect of having available money, the government agency seems destined to assume a more vital role in mental drug evaluation. But in view of the firm favor the drugs already enjoy among many doctors, even an adverse report by NIMH might do little to diminish their popularity.



New Launching for the Navy

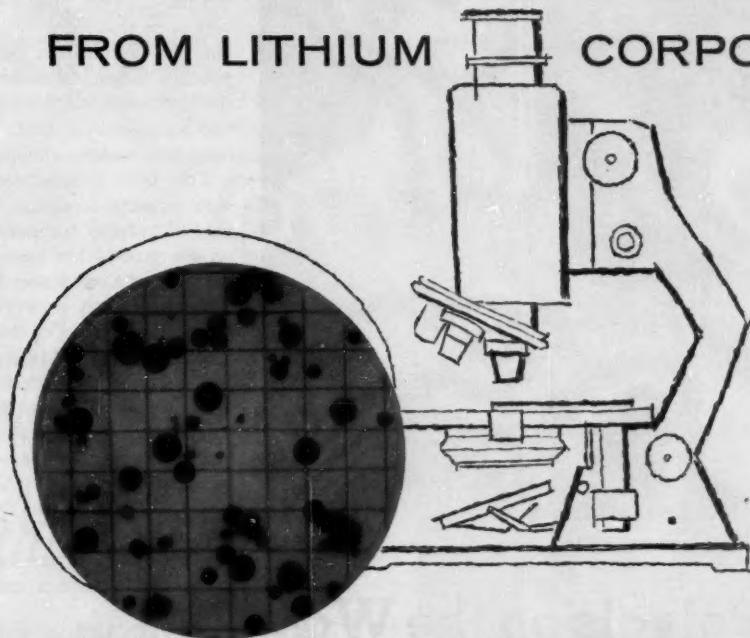
CONSTRUCTION is nearing completion on the Navy's first research atomic reactor. Located at the Naval Research Laboratory (Washington, D. C.), it will contain a reactor core of uranium 235 surrounded by a large pool

(center) of water. Shielding consists of concrete, lead, and special materials, is pierced by seven holes or "beam ports." These may be opened to permit emergence of neutrons for use in a variety of research problems.

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CELANESE'S ROBESON (left) and MARTIN: For polyol users, new variety.

Cheaper Polyols on the Way

Makers of polyurethane foams and alkyd resins are this week getting their first shipments of trimethylolpropane from Celanese Corp.'s new "interim aldol" unit at Bishop, Tex.

A trihydroxy compound that acts as a cross-linking agent, the product is exciting interest among makers of plastics and coatings. Reason: a dip from 70-90¢/lb. to 43¢/lb., made possible by a new process.

The 43¢/lb. tag is a development price, the firm avers; later on it will shoot for 35¢/lb., which will put the compound just a few pennies above one of the workhorses of the alkyd industry, pentaerythritol (32¢/lb.).

Initially, biggest use of trimethylolpropane is expected to come in alkyds and rigid urethane foams. In foams, it contributes hardness and heat resistance. Also, it's reported to be more soluble than trimethylolethane and easier to mix in compounding polyesters and prepolymers with diisocyanates. In alkyds, it contributes improved adhesion, color, color retention, as well as hardness.

And it's also looking for jobs in synthetic drying oils, plasticizers, surface-active agents.

Other polyols are also slated for

production by Celanese's new unit. Trimethylolethane, a close relative of trimethylolpropane, is scheduled to hit the market soon. And anhydroenneaheptitol — 3,3,5,5-tetrakis-(hydroxymethyl)-4-pyranol—still in the pilot plant, is also eyeing a niche in the alkyd business.

Celanese estimates that in 1956, some 4 million lbs. of trimethylolethane and trimethylolpropane will be used in this country and that by 1961 the figure should jump to 16-21 million lbs.

As Others See It: Among urethane foam producers—including Nopco Chemical Co. (Harrison, N. J.), Hudson Foam Latex (Yonkers, N. Y.), American Collo (Palisades Park, N. J.)—trimethylolpropane's price cut is earning the compound new appraisal.

Nopco, probably the country's largest producer of rigid urethane foams, thinks that trimethylolpropane has a definite place in rigid as well as flexible foams.

Polyester producers (who supply urethane foam formulators), including Mobay (St. Louis), Pittsburgh Plate Glass (Pittsburgh, Pa.), Reichhold Chemicals (White Plains, N. Y.), agree.

Secret Step: Behind the price cut,

declares Celanese, is an improved aldol process. Although it won't disclose details, the firm does say that the secret lies in a special method of carrying out the reaction, plus a series of complex steps that solve the difficult problem of purification without costly product losses. Celanese reveals that the process starts with formaldehyde and butyraldehyde (both of which the company makes, although it doesn't sell the latter commercially), dovetails with existing company work in the field of hydroxy compounds. A patent on the process has been applied for.

Plenty of Confidence: Max Robeson was a key man in working out the chemistry problems of the process. Researchers Alfred Martin and R. I. Davis steered the scale-up operations. Pilot-plant work began last December, but Celanese was so confident of the process that work on the interim unit began before the pilot plant was completed. First shipments from this unit were made in April. It reportedly can turn out 1 million lbs. this year, eventually should have a capacity of 10 million lbs.

The product itself is far from unknown. The Germans used trimethylolpropane in urethane foam formulations—Bayer is generally credited with the discovery that compounds containing one or more hydroxyl groups impart rigidity to the foam.

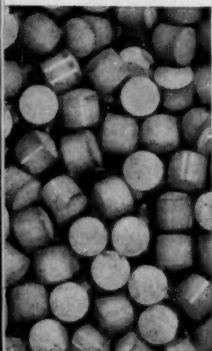
Trojan Powder Co. (Allentown, Pa.), first in the country to produce trimethylolethane and trimethylolpropane, says it will remain in the trimethylolpropane business and will meet competitive prices.

Heyden, too, makes trimethylolethane commercially, supplies trimethylolpropane from a pilot plant. It hasn't yet decided to go into production of the latter on a commercial basis, feels that trimethylolethane has the better long-range future.

The competitive cross-linking product in this field is Carbide and Carbon's hexanetriol-1,2,6. An acrolein derivative, it's been commercially available about two years, sells for 40¢/lb.

Carbide feels its product is better suited for alkyds than the other polyols because it makes for a more flexible film.

As for its future plans, Celanese says it doesn't intend to make polyol-base products (e.g., polyesters), feels that it will be kept busy enough developing new polyols and markets for them.



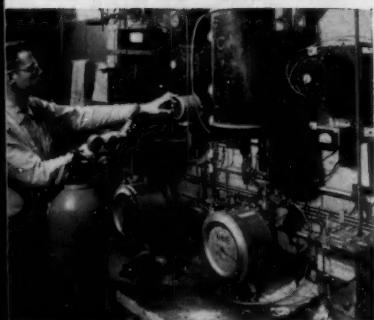
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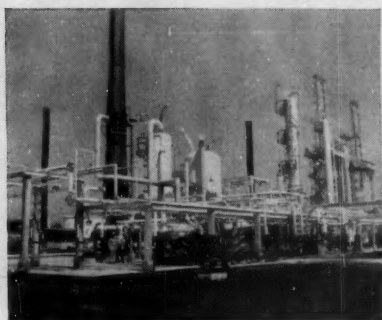
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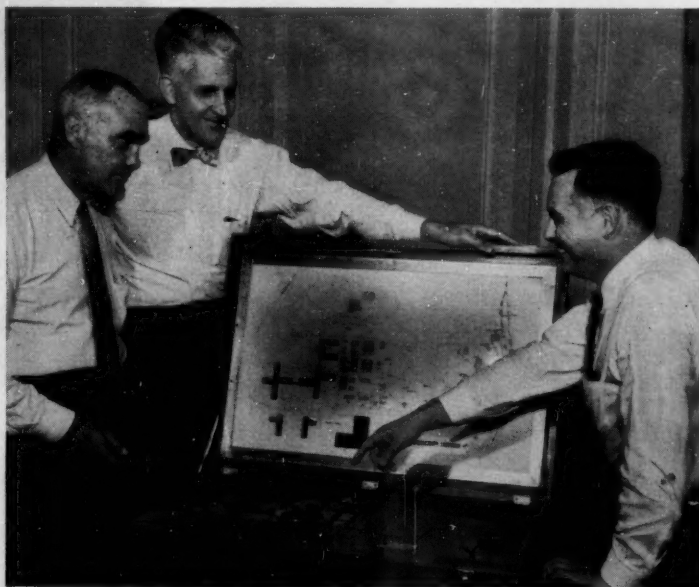
While Rohm & Haas and Permutit (New York) skirmish over the former's ion-exchange resin patents,* Chemical Process Co. (Redwood City, Calif.) has quietly unveiled a new anionic resin series that may make both take pause. Styrene-based, highly porous and strongly basic, the series—Duolite A-100—is out to compete with Rohm & Haas' Amberlites IRA -400, IRA 401; Permutit's S-1, S-2; and Dow's Dowex 1 and 2 resins.

Chempro says it cross-links without using a polyvinyl compound, processes the resin under far less severe

conditions than those accompanying halo-alkylation. Essentially, Chempro attaches a new chemical group (which aminates readily) to the resin matrix, eliminates the need for halo-alkylation.

As Chempro sees it, halo-alkylation, the conventional method of forming polystyrene intermediates prior to amination, has two disadvantages: (1) the strong tendency toward bridging produced by halo-alkylation results in secondary cross-linking that is difficult to control in commercial practice, leads to exchange resins with an indeterminate degree of cross-linking; and (2) there is some indication that organic debris from the resin itself, produced through deterioration of the resin during halo-alkylation, may contaminate extremely pure water prepared by ion exchange. Chempro

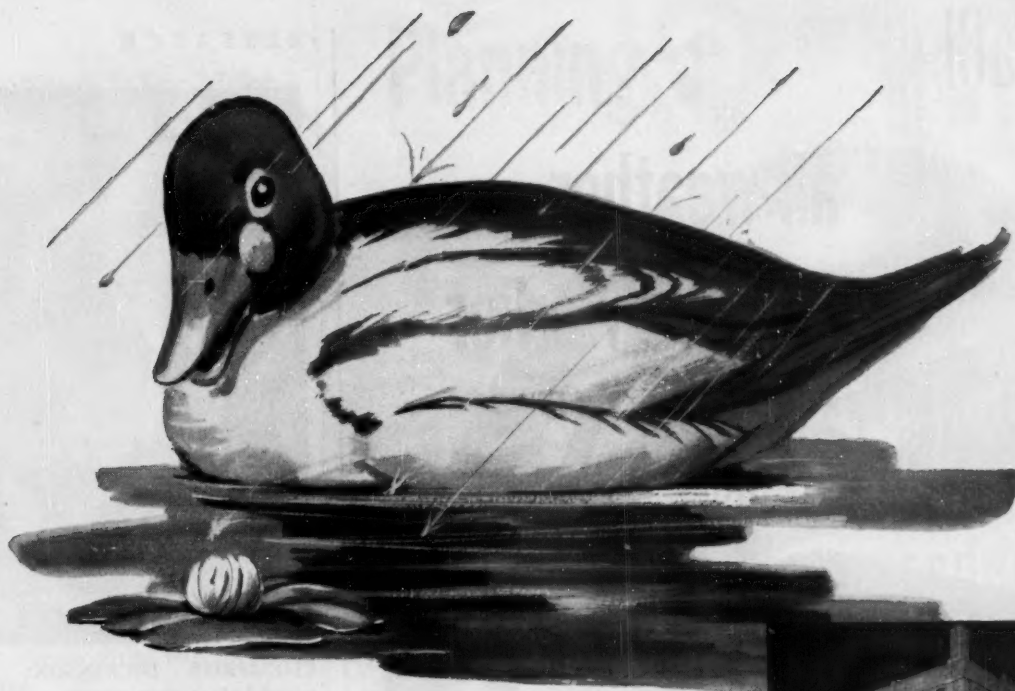
*Rohm & Haas reportedly makes its quaternary ammonium anion resins by divinyl benzene cross-linking, followed by chloro-methylation and amination. Permutit says it does not use polyvinyl aromatic hydrocarbon cross-linking, hence is not infringing on Rohm & Haas patents. But R&H claims Permutit's use of an ester (probably ethylene glycol dimethacrylate) makes it liable under the doctrine of equivalents.



Laboratory in a Suitcase

EXPANSION plans for Hercules' research center (formerly known as its experiment station) are mapped on this model under inspection by (left to right) the firm's president, A. E. Forster (see also p. 130); director of research,

Robert Cairns; and director of the research center, Peter VanWyck. Hercules now spends \$8 million/year for research, employs 750 at the center. But it's already planning for a quadrupled research workload.



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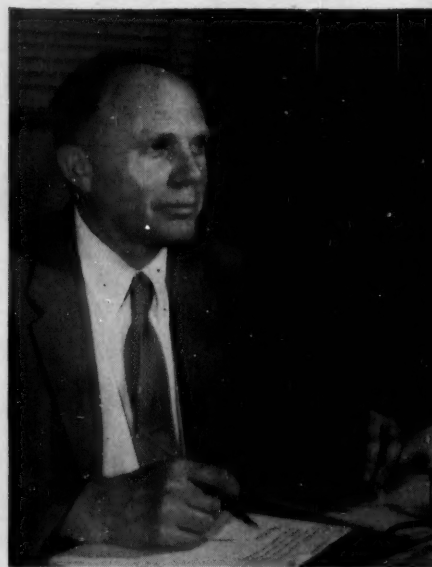
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CHEMPRO'S DICKINSON: For mixed beds, a resin sleeper.

claims its new process licks both these problems.

Furthermore, Chempro claims its A-100 resins are more highly porous than competitive resins, are therefore less susceptible to poisoning through irreversible adsorption of trace quantities of large organic molecules often present in surface waters. In lower-porosity resins currently available, mechanical blockage of the exchanger beads may occur through accumulation of organic debris.

B. N. Dickinson, Chempro's technical director, sees a big future for the new resins in mixed-bed de-ionization of water. Reduction of inorganic residues coming from the resin itself should be particularly desirable in treating water for high-pressure steam boilers. And the newcomers' longer life might cut de-ionization costs.

Present anion resins, normally regenerated with sodium chloride, require restoration with sodium hypochlorite after about 10 cycles. The A-100 resins, on the other hand, are expected to need less frequent restoration. At \$75/cu. ft.—within the range of competing resins—the new Duolites will probably stir interest, too, in sugar decolorizing, pharmaceutical uses, isolation and concentration of uranium from acid leach liquors. But they'll be getting a battle from Chempro's well-entrenched competition.

How Much Is Too Much?

CPVC is a term that good paint chemists learn early and learn well. It stands for "critical pigment volume concentration"—the point at which a paint vehicle contains all the pigment it can utilize effectively and economically. Last week at the 39th annual conference of the Chemical Institute of Canada, Celanese Corp. chemist John Becker, Jr., offered a new candidate to fill the need for a better method of determining CPVC of emulsion paints.

Becker's method, developed in conjunction with fellow researcher Donald Howell (at the company's Summit, N.J. laboratories), relies on a measure of the tensile strength of pigmented polymer emulsion films. Very simply, he finds that tensile strength is highest at CPVC, slopes off at PVC's above and below the critical (expressed as a percent).

If Becker and Howell's technique proves out, it will provide emulsion paint formulators with the equivalent of a tool that is an important stand-by in oil-paintmaking. For years, producers of these older paints have built economy and good performance into their products by formulating them to a point just short of CPVC.

CPVC of oleoresinous binders (used in oil paints) may be checked by a number of characteristics (e.g., gloss, moisture permeability) none of which is much good for pinpointing CPVC of resin emulsion paints. (Gloss of emulsion paints is too low for this purpose, while moisture permeability is too high.)

Matter of Size: The Celanese team tested their method on three polyvinyl acetate copolymers, five polyvinyl acetate homopolymers, an acrylic and a styrene-butadiene emulsion. They discovered, among other things, that CPVC of various polyvinyl acetate emulsions differ markedly from one another—the difference is primarily a function of emulsion particle size.

And they obtained good agreement between CPVC values by the tensile strength technique and by such other systems as elongation, enamel hold-out, scrub resistance and stain removal. Noting that their method is independent of degree of plastization of emulsion films, researchers Becker and Howell conclude that CPVC of any emulsion binder can best be deter-

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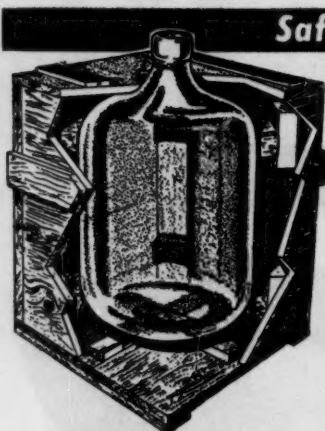
A chemical plant is, by its nature, a highly complicated, ingeniously contrived "machine" composed of vats, pipelines, control boxes, intricate electronic mechanisms, and all of the other devices and structures peculiar to the industry. † Mostly, though, it's people. Not only people working in the production of chemicals. But people whose sole important activity is to help customers. Here at Wyandotte we call this activity personalized technical service—for that's what it is . . . and what you get. It includes experienced personnel dedicated to product research. It includes skilled chemists who help broaden the application of Wyandotte products to the greatest advantage of customers. It includes top-flight engineers, ready to assist customers in improving manufacturing and handling methods . . . to search out production economies, offer preliminary layouts, recommend types of material and equipment. † If this kind of personalized technical service can be

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RESEARCH

mined by tensile strength measurement.

Besides telling how much pigment is too much, the tensile strength technique should also help formulators select the best vehicle for emulsion paints. Celanese, which makes both acetic acid and anhydride (used in polyvinyl acetate production), may well be hoping that a better way to tell CPVC may be a good way to help sell more PVAc.

REPORTS

New government research reports on a variety of chemical topics are now available from the Office of Technical Service, U.S. Commerce Dept., Washington 25, D. C.:

- "Analysis and Control of Black Chromium Plating Solutions" (PB 111830, 50¢) reports on a fast method of analyzing a mixture of chromic and acetic acids in black chrome plating solution.

- "Investigation and Development of High-Temperature Structural Adhesives" (PB 111768, \$3) discusses

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FOR OBSERVING the paths of speeding atomic particles, University of Michigan physicist Donald Glaser devised the bubble chamber he's shown inspecting. Some of the particles live less than ten millionths of a second, are observed by the trails of tiny bubbles they leave in the glass-walled chamber (center).



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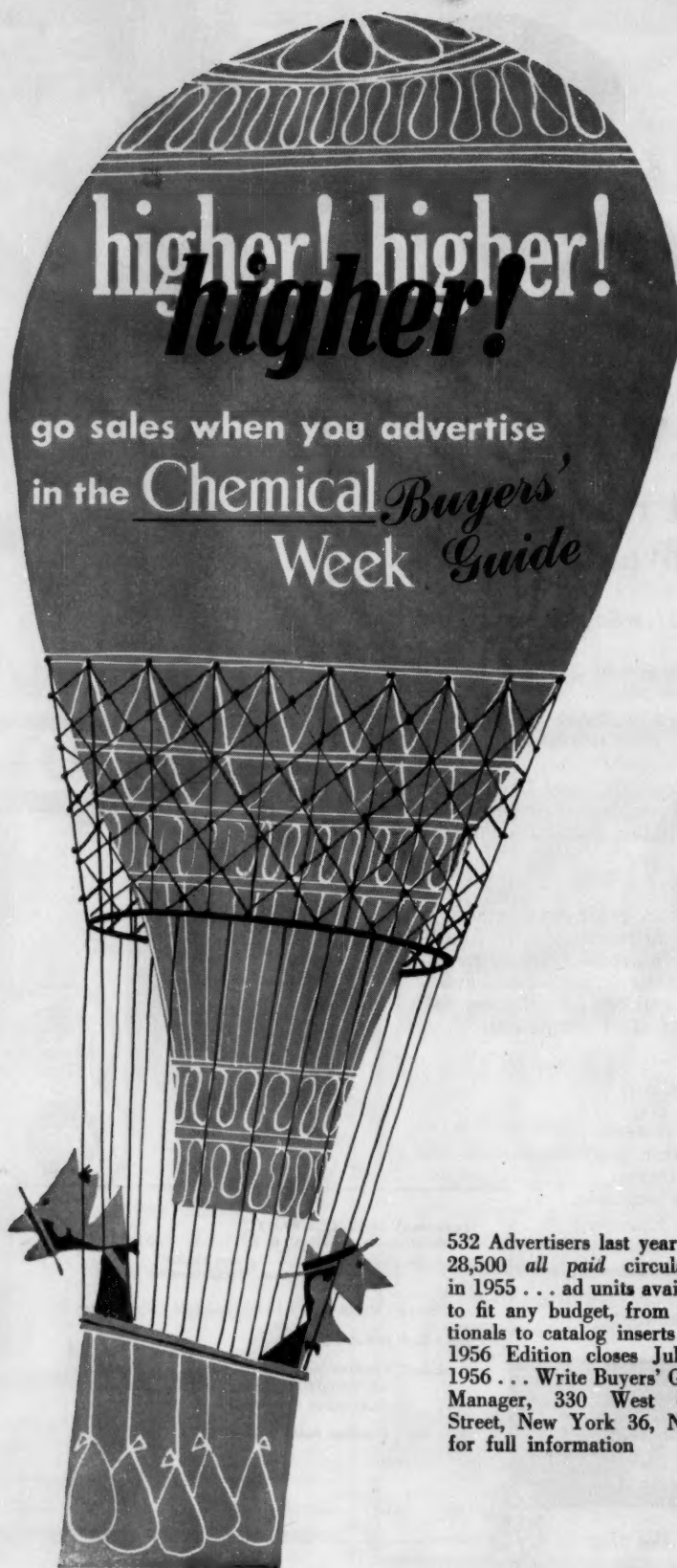
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RESEARCH

evaluation of a number of commercially compounded metal-to-metal adhesives, e. g., silicone resins, rubber, copolymers. None reached the Air Force's research goal of long-term service (1,200 hours) at 700 F or higher.

- "Poly FBA—A Fluorinated Acrylic Elastomer for High Temperature Service in the Presence of Aircraft Fuels and Lubricants" (PB 111946, \$1.50) analyzes properties and uses of a new synthetic elastomer, Poly FBA, which reportedly combines fuel-, oil- and solvent-resistance with high-temperature stability.

- "Evaluation of Organic Fluorine Compounds for Use in Military Aircraft" (PB 111983, 75¢) designates dibromodifluoromethane and bromotrifluoromethane as effective in extinguishing fires involving rocket propellant mixtures.

- "A Study and Evaluation of Kel-F Elastomer" (PB 111984, \$1.25) summarizes results of compounding studies. For low compression set and good chemical resistance, the most promising Kel-F elastomers are reportedly those cured with benzoyl peroxide.

- "Elastomeric Dithiopolyesters" (PB 111949, 75¢) discusses preparation, compounding, and vulcanization of elastomers made from a condensation product of mercaptoacetic acid and triethylene glycol. Behavior of these vulcanizates in fuels, synthetic ester-base oils, and effects of aging them at elevated temperatures are described.

- "Boundary Lubrication Studies of Typical Fluoroesters" (PB 111906, \$1.25) describes boundary-lubricating and wear-preventive properties of some new fluorinate diesters synthesized from aliphatic dibasic acids and nearly completely fluorinated alcohols.

- "Organosilanes and Related Compounds as High-Temperature Lubricants, Part I—Synthesis and Properties of Dodecyltrialkylsilanes" (PB 121003, 75¢) indicates that these compounds have promise as base stocks for certain extreme high-temperature fluid and lubricant applications.

- "Development of a Tracer Technique" (PB 111952, \$2.25) discusses the development of an air tracer technique using tritiated ethane as the tracer gas, points out that the tracer presents no radiological or chemical health hazards.

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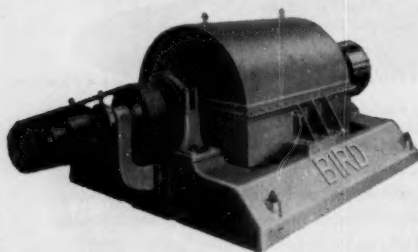
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Example:

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Example:

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Market

Newsletter

CHEMICAL WEEK
June 9, 1956

"Higher manufacturing costs" continues to be quoted as a prime reason for many chemical price increases. Latest to be boosted are the bromides—ammonium, calcium, potassium and sodium. The hikes: 2-7¢/lb.

Ammonium bromide will now cost consumers 43¢/lb. (up from 40¢); potassium and sodium bromides are 2¢/lb. higher at 38¢, while the calcium salt (in 50-lb. jars) moves up 7¢/lb. to a new level of \$1.05.

Earlier in the week, synthetic phenol prices were advanced for the same avowed reason—mounting production costs. New tank-car or tank-truck tag, effective July 1, will be 18¢/lb., a full 1¢/lb. above last summer's so-called "phony" 17¢ price (*CW Market Newsletter*, Aug. 20, '55).

Up too, are prices on phenol solutions, *p*-chlorophenol and *o*-chlorophenol. Third-quarter tank-car prices on 85% solution, for example, will be 15.6¢/lb.; c.l. quantities, 17.6¢; and l.c.l., 19.6¢/lb.

Natural phenol customers will probably have to pay more for their needs, too. Producers are expected to follow the synthetic makers' lead soon, boost natural phenol prices 1-1½¢/lb., depending on quantity.

Selling prices on two salicylates, methyl and sodium, as well as on several intermediates including *p*-nitrophenol, *p*-chloroaniline and *p*-phenetidine, are moving upward as a result of the phenol jump.

One major producer, reluctant to be identified, moved quietly over the weekend to up drum prices (c.l. and l.c.l. quantities) on a number of aliphatic organics—and caught competitors with price schedules down.

Products affected by the ½¢/lb. increase include the ethanolamines, mono, di and tri; ethylene, diethylene, triethylene glycols as well as polyethylene glycols; glycol ethers; morpholine; ethylene dichloride. Only the drum differentials change; tank car prices remain the same.

Word from others in the field won't be officially forthcoming for a while yet, but chances are that higher prices will become industry standard.

Up—then down again—in the space of a month. That's the pattern Goodrich-Gulf's synthetic rubber prices have taken. A reduction of 0.9¢/lb., effective immediately, cancels a May 1 increase of a similar amount, returns the item's f.o.b. price to 23¢/lb., the delivered tag to 24.1¢.

The reduction, explains Goodrich-Gulf's president, William Burt, is being made because of a great price drop in the natural rubber market, which has fallen "considerably below 30¢, and because of a slow-up in demand, particularly from the auto industry."

The company's price jump a month ago was reportedly to meet competition and to partly offset higher costs of labor, component materials and increased freight rates.

Market Newsletter

(Continued)

Fluoridation is in the news again. The city of Cleveland has officially accepted 300 tons of imported sodium silicofluoride, and is expected to start fluoridating its water supply by the end of this month or early in July. The city needs a total of 900 tons of material, and, some sources say, has been assured of receiving quotations on the balance (600 tons) required. It could be foreign silicofluoride or domestic sodium fluoride.

Pricewise, resale tags on imported silicofluoride, as reported earlier (*CW Market Newsletter*, May 26), appear to be easing, with some quotes in the 9½-12¢/lb.-range. Domestic material, however, is firm at 7½¢/lb. (c.i., t.l.), and will probably remain pegged at that price, at least through the third quarter.

"About 80% complete now, with some of the new facilities already in full use." That's the gist of a report on Shea Chemical's \$5-million, four-plant expansion program. Biggest feature of the company's broadening, according to President Vincent Shea, is the 140% increase in the firm's elemental phosphorus capacity, which permits doubling its sodium phosphate production and boosting phosphoric acid capacity by a third.

A new phosphorus furnace, plus enlarging of a present one at Shea's Columbia, Tenn., installation will hike production there to some 45,000 tons/year of elemental phosphorus.

At least one major anhydrous ammonia producer, Nitrogen Division (Allied Chemical), has already announced a \$5/ton cut, effective July 1, on its commercial-grade material. Affected are areas other than the West Coast. New price, with freight equalized with the nearest producing point, will be \$80/ton.

The company has also posted prices for new fertilizer year (delivery July 1, '56, to June 30, '57) on its Arcadian nitrogen solutions. Tags on the latter are f.o.b. Hopewell, Va., Southpoint, O., and La Platte, Neb., equalized on a delivered basis with cost of competitive solutions.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 4, 1956

UP		
	Change	New Price
Allyl bromide, chys., wks.	\$0.10	\$1.50
Lithium bromide, NF, drms., wks., frt. equal	0.15	2.45
Methyl salicylate, USP, cns., 500-lb. lots	0.03	0.59
Potassium chloride, indust., bulk, cars, f.o.b. Carlsbad ton ..	2.00	29.00
Sodium salicylate, USP, drms	0.03	0.74
DOWN		
Potassium pyrophosphate, tetrabasic, drms., wks.	\$0.01	\$0.155
Tankage, Chicago, bulk, unit-ton	0.25	5.25

All prices per pound unless quantity is stated.

MARKETS

THE PESTICIDES SITUATION

Here's what's needed this year:*

Major pesticides	1955-1956 (million lbs.)
• Benzene hexachloride (gamma isomer basis; includes lindane)	7-9
• Calcium arsenate	8-12
• Copper sulfate (ag use only)	40-55
• 2, 4-D acid	25-28
• DDT	50-60
• Parathion	3.5-5
• Pyrethrum	7.5-8.5
• Rotenone	6-7
• 2, 4, 5-T acid	2.5-3.5
• Aldrin, chlordane, dieldrin, endrin, heptachlor, and toxaphene	35-50

*Crop year: Oct. 1, to following September 30.

Here's last year's production compared with '54's:

	1954 (million lbs.)	1955 (million lbs.)
• Benzene hexachloride (gross; not including lindane)	77	55
• Benzene hexachloride (gamma equiv.)	11.5	10
• Calcium arsenate	2.8	4.2
• Copper naphthenate	3.6	not avail.
• Copper sulfate	130.6	156.2
• 2, 4-D acid	30.2	34.1
• 2, 4-D esters and salts	22.7	28.2
• DDT	97.2	125.1
• Lead arsenate	15.6	14.8
• Methyl bromide	n.a.	n.a.
• Parathion	3.9	n.a.
• Phenothiazine	3.4	n.a.
• Sodium chlorate	75.6	93.2
• 2, 4, 5-T acid and derivatives	6.6	n.a.
• Tetraethyl pyrophosphate (40% basis)	.4	.5
• Ziram	1.1	n.a.
• Aldrin, chlordane, dieldrin, endrin, heptachlor, and toxaphene	45.2	68

weed killers for domestic use during the new crop year is sizable; there's ample production capacity for all anticipated agricultural needs of major items.

Too, there's a caution: pesticides users can avoid temporary or local shortages that may be due to distribution problems by placing orders as early as possible.

An interesting sidelight to Shepard's report is the revelation that the pesticide formulations business isn't as large as one might suppose. Pesticide usage amounts to only about one-thirtieth of the total tonnage of farm chemicals. An estimated ag chemical consumption breakdown for '54, for example, runs like this:

	(million tons)
Fertilizers	23
Liming materials	19
Pesticides, formulated	1.5
Misc. (feed supplements, etc.)	1
Total	44.5

Better Business: Taken as a whole, though, sales and production of insecticides, fungicides and weed killers are big business, and indications are—despite some previous temporary setbacks—it's getting bigger. For instance, the industry reports that '55 was better than any year since 1951. Conditions over extensive areas favored development of heavy boll weevil infestations on cotton; in the Midwest, populations of grasshoppers and the European corn borer were seriously large; extensive forested areas in the western U.S. were aerially sprayed in '55 to control timber insect pests.

It's expected that about 1.2 million acres of Western timber infested with spruce budworm will this year be aerially sprayed with DDT—an assured outlet for at least that many million pounds of DDT, since the normal application rate is 1 lb./acre.

In addition, an accelerated program, now under way, to eliminate the gypsy moth in the Northeast, calls for DDT spraying of some 1 million acres during May and June.

Late summer and fall surveys last year indicated that the grasshopper threat in range lands of the Southwest was more widespread and severe than at any time in recent years. And grass-

Pesticides: Enough for All

What's the outlook for pesticides in this country? Producers, formulators and consumers this week are likely studying a new authoritative prognostication out of Washington—the Agriculture Dept. Commodity Stabilization Service's 1955-56 Pesticides Survey.

And chances are they'll find it does little more than give official recognition to a number of industry observations.

The annual report, prepared by the agency's Harold Shepard, points out that the over-all supply of bug and

MARKETS

U.S. DDT Production and Exports

Calendar year	(1,000 lbs.)	(1,000 lbs.)	Value (\$1,000)	Percent of output
1951	106,139	—	14,752	—
1952	99,929	32,288	15,731	32.3
1953	84,366	31,410	10,519	37.2
1954	97,198	42,329	13,438	43.6
1955	125,134	53,252	16,184	42.6

hoppers appear more threatening to crop areas in 1956 than in '55.

Figures for '55 on aerial treatments with pesticides and defoliant in the U.S. aren't yet available from most states, but it appears that slightly fewer acres were treated in '54 (some 31 million) than in the previous year (33.9 million). Material applied dry in 1954 totaled 234 million lbs.; as liquids, 90.7 million gal. of diluted spray materials.

A new development slated to increase the use of insecticides generally are granular insecticides. Promising advantages: ease of application; avoidance of drift. Such granular materials, too, increase the efficiency of formulating fertilizer-insecticide mixtures.

Total use of these mixtures is on a definite uptrend. In '53, an estimated 90,000 tons were used; in '54, about 150,000 tons; and during '55, some 200,000 tons.

Future for DDT: One of the top pesticidal chemicals, in production and use, is—and will continue to be—DDT. Output over the past few years has fluctuated with demand, of course, and particularly with export requirements under government buying programs for "friendly countries."

Actual consumption in the U.S. during the last crop year (1954-55) appears to have been 55-60 million lbs., highest since '51. In 1954-55, exports were at a record high of nearly 51 million lbs., compared with the 42.7 million shipped out in the previous corresponding period.

Domestic sales and exports during the new crop year will likely match, if not exceed, last year's bustling business. U.S. home needs are expected to hit 50-60 million lbs., while the proportion of production headed overseas will probably be about the same as in '55 (see table, above). During that calendar year, some 42.6% (about 53.2 million lbs.) of the 125 million lbs. produced were exported largely because

of the extensive foreign assistance projects.

Enough Gamma: Production of benzene hexachloride (BHC) last year, according to the government appraisal, dropped nearly 12% under that for '54, but consumption during the 1954-55 crop season was fairly high, well above the previous year. This was underscored by the considerable reduc-

tion in carry-over stocks during the period.

Domestic disappearance of BHC (and lindane) at the producers' level during 1954-55 was about 7.8 million lbs. (gamma isomer basis); U.S. demand in the new crop year may go as high as 9 million. (In the 5-month period, Oct. '55 through Feb. '56, BHC production amounted to 24 million lbs., with a gamma content of about 4.4 million lbs.)

New crop season requirements (see table, p. 129) for the chlorinated hydrocarbon group (aldrin, chlordane, dieldrin, endrin, heptachlor and toxaphene) is expected to fall off 5-10% from last year's disappearance level, but when compared with earlier years, it's still a hefty piece of business.

Over-all production of the group in 1954-55 was surprisingly 50% higher than in the previous crop year, due



Market Research Award

ALBERT E. FORSTER (left), chairman and president of Hercules Powder, is this year's recipient of the Chemical Market Research Assn.'s Memorial Award. The presentation was made by the group's president, C. P. Neidig, at a banquet following the two-day spring

meeting (CW, May 26, p. 98) in New York.

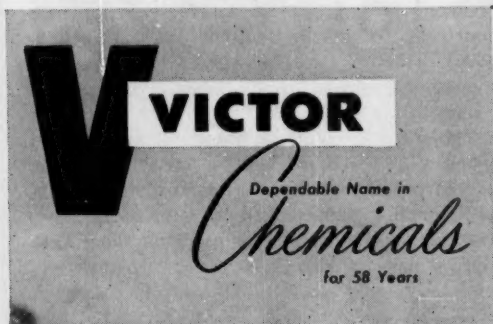
Forster won the award because "of his appreciation of the importance of market research and his use of it in guiding the growth and diversification of Hercules Powder Co."

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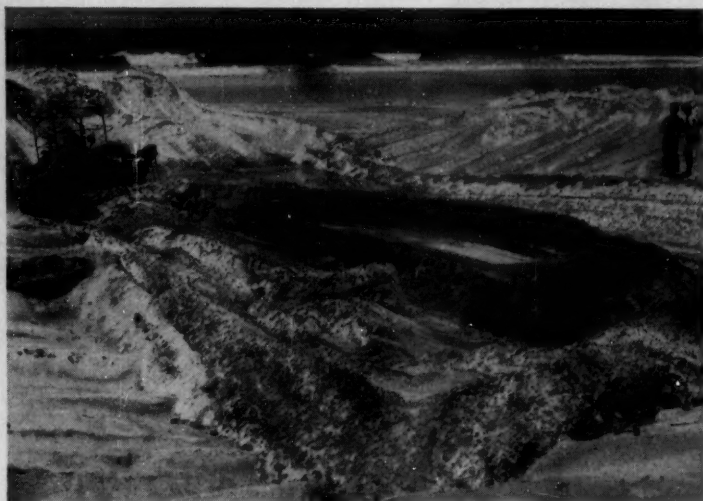
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MARKETS

chiefly to heavy demand for cotton insecticides, to expanding soil and field crop applications, and to shipments abroad.

Pyrethrum Release: On or before next Sept. 17, approximately 75,000 lbs. of 20% pyrethrum extract will be available for sale. It's material recently released from the national stockpile, the second such lot to hit the domestic market. Last year, about 60,000 lbs. were sold by the government. Pyrethrum usage in the U.S. (100,000 lbs./year) is about two-thirds of world consumption.

Pesticides Sum-up: The new survey on the pesticide situation for 1956 lines out production and consumption of a number of insecticides, fungicides, weed killers, miticides (e.g., 85 million lbs. of sulfur is being used on cotton for mite control), defoliants and desiccants, as well as some fumigants, dust carriers and diluents. But aside from purely statistical information, producers and formulators may well presume that the new crop year won't be as bad as they had expected, even though sales will be a little harder to make than in some past years.



Titanium Supply Insurance

Most titanium producers are optimistic about the lightweight metal's growth possibilities. But more titanium calls for more rutile, a prime raw material. Thus National Lead's recent hefty investment (more than \$1.5 million) in the rutile-loaded black beach sands of Australia (*see cut above*) is understandable supply insurance.

Australia is, of course, one of the world's chief sources of high-quality rutile, last year supplied more than 50,000 tons—enough to produce some 25,000 tons of titanium. And reserves there are extensive.


National Lead has formed a new

operating company with Australia's Mineral Deposits Syndicate, and will immediately begin construction of a rutile treatment plant at Port Macquarie.

Principal customers for the rutile mined from the black sands (which also contain other minerals, including zircon and ilmenite) are the U.S., Britain, France, Belgium and Japan.

Material from the National Lead venture will be used to produce titanium at the company's Titanium Metals plant at Henderson, Nev., as well as for supplying other U.S. producers.

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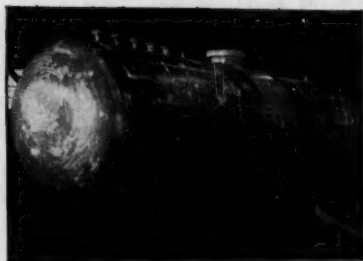
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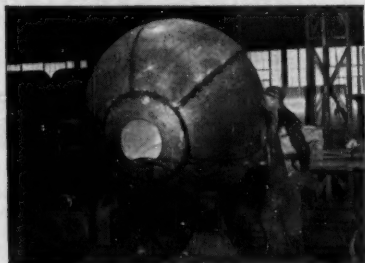
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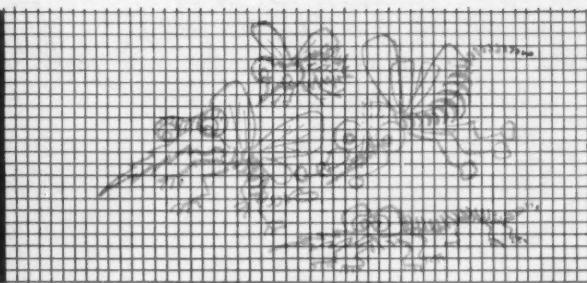
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